

03331-1643

2023 EDITION



### INSIDE THIS EDITION ▾

- ◆ Factors Affecting Adherence To Anti-retroviral Drugs Among HIV Patients In A Tertiary Health Facility In South East, Nigeria.
- ◆ Cervical Cancer As A Sexually Transmitted Disease: Implications And Applications
- ◆ Monkeypox And Sexual Health
- ◆ Maputo Protocol VS Nigerian Law
- ◆ Female Genital Mutilation; Myths, Facts And Abolishment.
- ◆ One Day Writers Would Loose Their Jobs To AI

THEME: SEXUAL MEDICINE AND REPRODUCTIVE HEALTH

# MEDIKKA

JOURNAL OF THE UNIVERSITY OF NIGERIA MEDICAL STUDENTS

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# The Editor's Note



In the new approach to Maslow's hierarchy of need, reproduction/sex was labeled as a physiological need - alongside food, water, air, sleep. But among them all, it can be argued that sex/reproduction comes with the greatest responsibility, and therefore, requires a more original and mature understanding than the others.

Medikka, therefore in its 2023 edition themed - Sexual Medicine and Reproductive Health, makes a beautiful attempt to capture its importance, impart knowledge on healthy sexual and reproductive lifestyle, and to educate youths who in the face of different views on this theme religious, traditional and modern, turn to their peers who are as informed or uninformed as them. This edition features research works, articles, reviews, all carefully selected and written by our wonderful contributors, for our consumption and assimilation.

Unending thanks to our editorial adviser, Dr Ijoma for her ever readiness and energetic support towards the success of this edition. I'm very grateful to University of Nigeria Medicine Alumni Association (UNCOMAA) for their support, financially and otherwise and to Dr Chukwuani Francis, to whom distance wasn't an excuse regarding this publication. The president, University of Nigeria Medical Students Association, Amaechi Favour Moses, for this opportunity and the previous Editor-in-Chief, Dr. Uwaezuoke Angelica, for your guidance, I'm very grateful to you. My editorial team,, for the sacrifices and resolve to make this happen, I can't thank them enough. We are the best!!!

**Anyanwu Tochukwu Cosmos,**  
Editor-in-Chief, Medikka 2023 Edition.



# The President's Note

**T**he path to knowledge is filled with withering ignorance, curiosity, confusion, repeated asking of questions, diligent study, discussing that which is known, exploring that which is not known, practicing and failing, practicing and excelling, practicing repeatedly, till that which is sort to be known becomes mere\_Mosco Tomwest.

Knowledge is Infinite as its pursuit endless, and it is to that endeavour this informative work of science, MEDIKKA journal was established by our founding fathers giving most reverence to Prof. Jonathan Azubuike, the mastermind. MEDIKKA is the official journal of the University of Nigeria Medical Students Association, spanning over 46years of informative rich research service. The journal serves the dual function of providing a platform for students to contribute to the academic discourse surrounding medical issues all over the world while also equipping them with the much-needed publication skills.

MEDIKKA is an outstanding Academia excerpt featuring high index value articles, citations and research publications from students, Doctors and Professors within and outside the college sphere . The enormous heritage of knowledge from our reputable lecturers and Alumni doctors keeps on watering our assured high index value publications. We have also seen a steady increase in readership and citations of our published articles especially with the introduction of the e-copy of the journal.

This year, under the leadership of Editor in chief, Tochuwu Cosmas Anyanwu, MEDIKKA unveils its 2022 edition themed "Sexual Medicine and Reproductive Health". This Edition is a consortium of renowned joint efforts of our editorial advisers/Consultants, University of Nigeria College of medicine Alumni(UNCOMA,N.A) and the idea filled Editorial Board. Special thanks to the editorial Adviser, Dr Mrs Ijoma, Board of supervising consultants, Dr Ekwuazi and Dr Francis Chukwuani, without whom's undiluted support we wouldn't have this brilliant edition. I am forever grateful to the Editorial Committee led by Rt.Hon. Tochukwu C Anyanwu for this edge cutting publications.

The 2022 Editorial Team has taken the reigns of our research a step forward, spurring increased research participation amongst students, pioneering outreaches to foster experience in the research field work and publishing a reader friendly informative piece of which there is no doubt promises a wonderful reading experience.

Ndewonu!

**Amaechi Favour-moses O**

President, University of Nigeria Medical Students Association 2022/2023.

# Contents ▾

## ORIGINAL RESEARCH

- 01 ▶ Knowledge, Attitude, And Prevalence Of Covid-19 Vaccination Among Members Of The University Of Nigeria, Enugu Campus Community
- 20 ▶ Factors Affecting Adherence To Anti-retroviral Drugs Among HIV Patients In A Tertiary Health Facility In South East, Nigeria.
- 43 ▶ Comparative Assessment Of Sanitary Conditions Of Students' Hostels At Enugu Campus And Ituku-ozalla Campus Of UNN.
- 60 ▶ Perception Of Risk And Barriers To Cervical Cancer Screening Among Women Attending Antenatal Care In University Of Nigeria Teaching Hospital (UNTH), Ituku-ozalla, Enugu State.

## REVIEW ARTICLES

- 84 ▶ Cervical Cancer As A Sexually Transmitted Disease: Implications And Applications
- 89 ▶ Monkeypox And Sexual Health

## EDUCATIONAL PAPERS

- 92 ▶ Female Genital Mutilation; Myths, Facts And Abolishment.
- 95 ▶ Racial Disparity In Uterine Fibroid
- 97 ▶ Sexual Appeal: The Benefits And Complications Of Cosmetic Surgery.
- 100 ▶ Contraception And Abortion In Nigeria: Laws And Safe Practices
- 103 ▶ Criminalization Of Suicidal Attempts In Nigeria: To Stay Or To Go.
- 105 ▶ The Maputo Protocol Vs Nigerian Law: A Brief Overview
- 107 ▶ Autism Spectrum Disorders

## MEDIKKA EXTRAS

- 108 ▶ The Truth About HIV/AIDS
- 109 ▶ One Day Writers Would Lose Their Job To AI. True Or False?
- 111 ▶ Anomaly
- 113 ▶ Needles
- 114 ▶ Welcome To Clinicals



# Knowledge, Attitude, And Prevalence Of COVID-19 Vaccination Among Members Of The University Of Nigeria, Enugu Campus Community

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## ABSTRACT

**BACKGROUND:** Globally, The Novel COVID-19 virus has had a great toll in the public health. As with the other pandemics, the knowledge, attitude and practical steps taken in preventing the spread of the disease has profound effect on the morbidity and mortality rate. In contrast to the developed countries in the world, the disposition towards the importance of Covid 19 vaccination has been subpar in developing countries like Nigeria. An enquiry towards this puzzling trend is the reason for our study.

**AIM:** Our aim is to assess the knowledge, attitude and prevalence of COVID-19 vaccination and factors affecting COVID-19 vaccination in the university community.

**MATERIALS AND METHODS:** We conducted a cross sectional descriptive study across different hostels and offices in the University of Nigeria, Enugu Campus. A purposive sampling technique was employed and information was obtained using a self-administered questionnaire. SPSS version 26 was used to analyze the data. Level of significance was at  $p < 0.05$ . Ethical clearance was obtained

**RESULTS:** Knowledge score of the participants are as follows: 24.33% had poor knowledge, 55.33% had moderate knowledge while 20.33% had good knowledge of the Covid 19 vaccination. The commonest source of information is social media/internet followed by television. The attitude of the population towards Covid 19 vaccination are as follows: 17.17% had negative attitude, 45.12% had neutral attitude while 37.71% had positive attitude towards Covid 19 vaccination. Our study revealed that 17.31% of the population had taken at least a dose of the vaccine while 82.69% haven't gotten the Covid 19 vaccine. The most common reason for not getting the vaccine was lack of interest, followed by ignorance of where to get vaccinated, fears about the financial implication, and ignorance of the presence of vaccines in the country

**CONCLUSION:** A lot of work has to be done to improve people's acceptance of COVID-19 vaccine if Nigeria is to reach her target of having 70% of the population vaccinated by the end of 2022. Proper enlightenment on the importance of Covid 19 vaccine and its availability, and building trust in the health care system should be our fulcrum towards increasing Covid 19 acceptability rate.

**KEYWORDS:** Keywords: Covid-19 vaccine, uptake, factors influencing.

## Background

The novel coronavirus disease 2019 (COVID-19) caused by severe acute respiratory coronavirus 2 was first discovered in the Wuhan animal market, Hubei Province, China in December 2019.<sup>1</sup>

Since its discovery, it has spread to more than 200 countries around the world and has been declared a pandemic by the World Health Organization.<sup>2</sup> COVID-19 has had unprecedented impacts on the health and well-being of people all over the world, as well as the economy of many countries.<sup>3,4</sup> In Nigeria, the index case was reported on 27 February 2020, and more than 50,000 cases and over two thousand deaths have been documented since then.<sup>5</sup>

By January 21, 2020, the WHO organization had discovered that the novel coronavirus could be spread from humans to humans, by

January 29, 2020, the use of facemasks in the community, during home care, and in health care settings was advised by the WHO and by January 30, the disease was labeled a Public Health Emergency of International Concern (PHEIC).<sup>6</sup> Furthermore, guidelines on mass gatherings were published on February 14, 2020, the disease<sup>7</sup> was characterized as a pandemic on March 11, 2020, and by March 23, 2020, the WHO and FIFA launched the 'Pass the message to kick out coronavirus' awareness campaign, led by world-renowned footballers, who called on people around the world to protect their health, through hand washing, coughing etiquette, not touching one's face, maintaining physical distance and staying home if feeling unwell.<sup>6</sup>

As with past outbreaks, the novel nature of the current coronavirus outbreak implied that no definitive therapy existed for its treatment,

instead, empirical therapies are being employed to manage the disease.<sup>1</sup> The rapid spread of the virus and continuous increase in the number of cases alongside partial and/or total lockdown protocols in most countries necessitated the urgent development of accurate diagnostic methods, effective treatments, and vaccines for the disease.<sup>8</sup> The long-term solution to COVID-19, however, would most likely be a safe, globally implemented vaccination program with a broad range of clinical and socioeconomic benefits.<sup>9</sup> It is of point to note that vaccination is one of the greatest achievements of modern medicine and it is the greatest human intervention besides clean water and sanitation.<sup>10</sup>

Major infections such as smallpox and rinderpest have been eradicated worldwide due to vaccines, while polio has almost been eradicated except for Afghanistan and Pakistan where it is still endemic.<sup>11-13</sup> The impact of vaccination on vaccine-preventable diseases cannot be overemphasized. The incidence and prevalence of diseases such as cervical cancer, hepatitis, yellow fever, tuberculosis, cholera, and tetanus, among others, have been severely reduced due to vaccine availability.<sup>11</sup> Vaccination plays important roles in disease eradication, control of mortality, morbidity, and complications, mitigation of disease severity, prevention of infection, and even protection of the unvaccinated population through herd immunity.<sup>10</sup> At the global vaccine summit that held on June 4, 2020, the importance of the availability of a safe, effective, and equitably accessible vaccine in controlling the COVID-19 pandemic was highlighted,<sup>6</sup> thus, the availability of COVID-19 vaccine(s) was projected to drastically change the course of the pandemic.

This realization led to the frantic rush to develop an effective vaccine. By July 14, 2020, Moderna had published initial Phase I/II clinical trial data, and Pfizer by August 12, 2020.<sup>14</sup> Pfizer's experimental vaccine eventually took first place in the vaccine development race by being the first vaccine to be approved by the WHO for emergency use on December 31, 2020.<sup>15</sup> Since then, the number of approved covid-19 has ballooned up to an impressive eleven vaccines as of May 5, 2021.<sup>16</sup>

On 2 March, the first shipment of four million Oxford–AstraZeneca COVID-19 vaccine doses from the COVAX initiative arrived at Nnamdi Azikiwe International Airport.<sup>17</sup> Cyprian Ngong, a doctor at National Hospital, Abuja, became the first person in Nigeria to receive a COVID-19 vaccine on March 5, 2021.<sup>18</sup> By the end of January 2022, 20.6 million vaccine doses had been administered with 6% of the target population being fully vaccinated<sup>19</sup> and by the end of April 2022, 7.05% of the population had been vaccinated fully with another 5.09% of the population partly vaccinated thus bringing the proportion of Nigerians that have received at least one dose of the vaccine to 12.14%. This is a smidgen compared to the proportion of the world's population that have received at least one dose of the vaccine (65.4%)<sup>20</sup> and a country like the United Arab Emirates whose have 99% of its population having taken at least one dose of the vaccine as of May 6, 2022.<sup>20</sup>

In view of all these, this study aims to find out the level of awareness about COVID-19 vaccines, the level of vaccination, and factors affecting vaccine uptake among the University of Nigeria, Enugu Campus Community.

## STATEMENT OF THE PROBLEM

Since the outbreak of COVID-19 disease in Nigeria which started February 27, 2020, there have been 223,905 confirmed cases and 2,985 deaths due to COVID-19, with 9383 active cases, all figures as of December 20, 2021.<sup>5</sup>

Thus, COVID-19 has constituted a major source of morbidity and mortality and currently militates against the achievement of SDG goal 3, ensure healthy lives and promote well-being for all of all ages.

Despite the immense benefits that vaccination has offered since the first discovery of the smallpox vaccine by Edward Jenner to date, saving millions of lives globally and doing so at a comparatively low cost, vaccine hesitancy has always plagued this great discovery. Vaccine hesitancy is “the reluctance or refusal to vaccinate despite the availability of vaccines”.<sup>21</sup> It was classified as one of the top ten threats to global health by the World Health Organization in 2019.<sup>21</sup> Vaccine hesitancy is a complex phenomenon, with a growing continuum between vaccine acceptance and refusal. Despite the proven effectiveness and safety of vaccines, an increasing number of individuals perceive vaccines as unsafe and unnecessary.<sup>22</sup> In recent times, there has been a steady decline in vaccine coverage and an increase in the occurrence of vaccine-preventable diseases. For instance, there has been a 30% rise in measles cases globally. Vaccine hesitancy is believed to contribute greatly to this.<sup>21,22</sup>

Nigeria is the most populated country in Africa and has a convoluted history of vaccine hesitancy. Vaccination coverage in Nigeria has continuously dropped since its peak of 81.5% in the 1990s, and by 2013, only 25% of children under the age of 2 were fully vaccinated.<sup>23</sup> The 2003/2004 polio vaccine refusal in Nigeria had a far-reaching effect. It increased the incidence of polio by many folds in Nigeria and contributed to outbreaks of polio across three other continents.<sup>24</sup>

Currently, available data as of May 5, 2022, shows that 7.05% of the Nigerian population have been fully vaccinated against COVID-19, and another 5.09% have been partially vaccinated where a person is considered partly vaccinated if they have received only one dose of a 2-dose vaccine protocol and a person is considered fully vaccinated if they have received a single-dose vaccine or both doses of a two-dose vaccine.<sup>25</sup>

Herd immunity occurs when a significant portion of a population becomes immune to an infectious disease, limiting further disease spread.

Disease spread occurs when some proportion of a population is susceptible to the disease. **Herd immunity** occurs when a significant portion of a population becomes immune to an infectious disease and the risk of spread from person to person decreases; those who are not immune are indirectly protected because ongoing disease spread is very small.<sup>26</sup>

Vaccine hesitancy could have a direct and wide-reaching effect on the acceptance of COVID-19 vaccine(s) by individuals in the community as it confers threat not only on the hesitant individual but on the community as a whole, as delays and refusals would make it impossible for communities to reach the threshold of vaccine uptake necessary for the conferment of herd immunity. While the focus of attention currently is on developing a vaccine to protect the population against COVID-19, stakeholders should prepare for the next challenge: vaccine adoption (access and acceptance) among the public.

The current uptake of COVID-19 vaccination in Nigeria is poor, thus our study aims to understand the knowledge and attitude of the University of Nigeria Enugu Campus community of and towards the COVID-19 vaccine respectively and to ascertain the factors associated with low vaccination uptake, with a view to proposing solutions to tackle the problem of vaccine hesitancy and reluctance, which will in turn result in an increased vaccine uptake, thus giving the Nigerian population the much needed herd immunity.

## JUSTIFICATION FOR THE STUDY

As the COVID-19 Vaccination is a relatively new development, not many studies have been carried out, especially in Nigeria on the attitude and prevalence of covid-19 vaccination and the factors affecting the latter.

Of the few studies already conducted, a good proportion of them was prospective, x-raying perception and uptake of hypothetical vaccines.<sup>27,28</sup>

Now that there are vaccines available in Nigeria, this study hopes to bridge this gap (namely that most of the studies in the literature with a Nigerian population were prospective studies, when the vaccine roll-out was yet to commence) identified from the literature review.

It is worthy of note though, to mention that a similar study was conducted at the Nnamdi Azikiwe University titled "COVID-19 vaccine hesitancy among staff and students in a Nigerian tertiary educational institution" and published on 1<sup>st</sup> November, 2021<sup>29</sup>, however, this study didn't do an in-depth analysis of the level of knowledge about COVID-19 vaccine but just asked about the number of those that had heard about the vaccine.

Furthermore, no study on our topic was found to have been conducted on our target population in the literature review.

We believe that the results from our study will go a long way in increasing COVID-19 vaccine awareness and uptake and thus bringing the population closer to achieving herd immunity when acted upon by the relevant authorities.

## RESEARCH QUESTIONS

1. What is the level of knowledge about the COVID-19 vaccine among members of the University of Nigeria, Enugu Campus community?
2. What is the attitude of members of the University of Nigeria, Enugu Campus community towards COVID-19 vaccination?
3. What is the level of COVID-19 vaccine coverage among members of the University of Nigeria, Enugu Campus community?
4. What are the factors that affect the attitude and uptake of COVID-19 vaccination among the members of the University of Nigeria, Enugu Campus community?

## OBJECTIVES OF THE STUDY

### General objective:

To assess the knowledge, attitude, and prevalence of COVID-19 vaccination among the university community.

### Specific objectives:

1. To determine the knowledge about COVID-19 and COVID-19 Vaccines among members of the University of Nigeria, Enugu Campus community.
2. To determine the attitude of members of the University of Nigeria, Enugu Campus community towards COVID-19 Vaccination.
3. To determine the level of COVID-19 vaccine coverage among members of the University of Nigeria, Enugu Campus community.
4. To determine the factors affecting attitude and uptake of COVID-19 vaccination among members of the University of Nigeria, Enugu Campus community.

## LITERATURE REVIEW

This literature review was conducted by searching for research articles on google scholar using the keywords in our topic and our objective.

As of May 5, 2022, about 65.4% of the world population has received at least one dose of a COVID-19 vaccine, 11.64 billion doses have been administered globally, and 9.25 million are now administered each day, however, only 15.8% of people in low-income countries have received at least one dose.<sup>25</sup>

There are several COVID-19 vaccines validated for use by WHO (given Emergency Use Listing). The first worldwide mass vaccination program started in early December 2020 and the number of vaccination doses administered is updated daily on the [COVID-19 dashboard](#).

The WHO Emergency Use Listing process determines whether a product can be recommended for use based on all the available data on safety and efficacy and its suitability in low- and middle-income countries. Vaccines are assessed to ensure they meet acceptable standards of quality, safety, and efficacy using clinical trial data, manufacturing, and quality control processes. The assessment weighs the threat posed by the emergency as well as the benefit that would accrue from the use of the product against any potential risks.

In line with their national regulations and legislation, countries have the autonomy to issue emergency use authorizations for any health product. Domestic emergency use authorizations are issued at the discretion of countries and are not subject to WHO approval. In view of all these, this study aims to find out the level of awareness about COVID-19 vaccines, the level of vaccination, and factors affecting vaccine uptake among the university of Nigeria, Enugu Campus Community.

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Vaccination.

3. To determine the level of COVID-19 vaccine coverage among members of the University of Nigeria, Enugu Campus community.
4. To determine the factors affecting attitude and uptake of COVID-19 vaccination among members of the University of Nigeria, Enugu Campus community.

## SAMPLE SIZE DETERMINATION

The minimum sample size for this study was determined by this equation<sup>46</sup>

$$N = \frac{Z\alpha^2 \times P(1-P)}{D^2}$$

$Z\alpha$  = confidence level is 95%,  $Z\alpha = 1.96$

$P$  = Overall vaccination prevalence among Nigerians = 12.14% = 0.1214<sup>25</sup>

$D$  = Margin of error tolerated = 4% = 0.04

$$N = \frac{1.96^2 \times 0.1214(1 - 0.1214)}{(0.04)^2}$$

$N = 256.10$

An addition of 10% to make up for attrition will bring the minimum sample size to;

$$10\% \text{ of } 256.10 = 10/100 \times 256.10 = 25.61$$

Minimum Sample size = 256.1 + 25.61 = 281.71

Minimum Sample size = 282

However, a sample size of 300 was used.

## SAMPLING TECHNIQUE

Due to the peculiarities of this time (the ASUU strike), we used the purposive sampling technique where we went to the hostels and off-campus lodges and shared the questionnaires among the students left. The same sampling technique was used for the other non-student members of the university community.

## STUDY INSTRUMENTS

A self-administered questionnaire was used for data collection. It consists of six sections. Section A collected sociodemographic data, section B collected data on the respondent's knowledge of

COVID-19. section C collected data on the respondent's knowledge about covid-19 vaccines, section D collected data on the respondents' attitude towards attitude to covid-19 vaccination, section E collected data on the respondent's perception of disease impact and section F will collected data on respondents perception of things that could increase COVID-19 vaccine uptake.

## DATA COLLECTION

Data was collected from medical students staying in Old UNTH and NUGA hostels, students in the faculties of Law, Health sciences, Environment sciences and Business administration staying in hostels in the UNEC campus and staying off-campus by the members of the research group.

We also collected data from lecturers and security guards of the University.

## DATA ANALYSIS

### Measurement of variables

Variables measured were sociodemographic variables (which included age, sex, department, marital status, occupation, religion, highest level of education, ethnicity), knowledge of participants of COVID-19 and COVID-19 vaccine, as assessed by a series of questions, attitude of participants towards COVID-19 assessed majorly by a 6 question likert scale, uptake of COVID-19 vaccine, as assessed by the question "Have you received the COVID-19 vaccine", factors affecting COVID-19 vaccine uptake and recommendations by our respondents to increase uptake of the vaccine by the general public.

### Statistics

Data analysis was done using the Statistical Package for the Social Sciences (SPSS) version 26.0. Data was presented in tables.

Summary statistics such as mean, frequency, and proportion was used to represent quantitative and qualitative data.

Knowledge and attitude scores were computed using SPSS based on their responses in the appropriate sections. The scores were computed using the Bloom's cut off point that divides total scores as follows: 0 – 59% represents a poor score, 60 – 79% represents a moderate score, and 80 – 100% represents a good score.<sup>47</sup>

We tested the relationship between the sociodemographic variables of the population, knowledge of covid-19 and covid-19 vaccination, selected variables in Section E (Factors affecting Covid-19 vaccination) as independent variables and their attitude to covid-19 vaccination and receipt of the vaccine (as the dependent variables) using statistical tests like Chi-square, Independent sample t-test, ANOVA, and Pearson's correlation coefficient and binary logistic regression depending on the variable types (categorical vs non-categorical variables).

Statistical significance was established at an alpha of  $p < 0.05$  for all statistical tests.

## ETHICAL CONSIDERATIONS

The research proposal was submitted to the Health Research and Ethics Committee, University of Nigeria Teaching Hospital (UNTH), Ituku-Ozalla, Enugu State where ethical clearance was obtained.

During data collection, verbal informed consent was obtained from the participants and the participants were told what the research was all about and that confidentiality would be maintained. Participants were also assured that no harm would come their way by their participating in our study.

## LIMITATIONS OF THE STUDY

We had to collect data during a period of the ASUU strike and the NASU strike. This prevented us from carrying out a proper multistage sampling and thus we resorted to using the purposive sampling technique.

## RESULTS

Table 1: A table showing the sociodemographic characteristics of the population.

Variable	Frequency	Percent	
Age as at last birthday  n = 284	<21	65	21.7
	21 – 30	197	65.7
	31 – 40	3	1.0
	41 – 50	13	4.3
	>50	6	2.0
	<b>Mean = 24.18</b>	<b>Std. Dev. = 7.27</b>	

<b>Faculty (For students)</b>  <b>n = 265</b>	<b>Medicine</b>	138	49.3
	<b>Health Sciences</b>	63	23.1
	<b>Basic Medical Sciences</b>	10	4.6
	<b>Business Administration</b>	15	6.5
	<b>Dentistry</b>	29	11.4
	<b>Law</b>	6	3.1
	<b>Environmental sciences</b>	4	2.0
<b>Sex</b>  <b>n = 300</b>	<b>Male</b>	106	35.3
	<b>Female</b>	194	64.7
<b>Occupation</b>  <b>n = 300</b>	<b>Student</b>	263	87.7
	<b>Lecturer</b>	21	7.0
	<b>Security</b>	16	5.3
<b>Marital status</b>  <b>n = 296</b>	<b>Single</b>	271	91.6
	<b>Married</b>	25	8.4
<b>Religion</b>  <b>n = 299</b>	<b>Christianity</b>	295	98.7
	<b>ATR</b>	1	.3
	<b>Athiest</b>	2	.7
	<b>Agnostic</b>	1	.3
<b>Ethnicity</b>  <b>n = 299</b>	<b>Igbo</b>	280	93.6
	<b>Yoruba</b>	2	.7
	<b>Other</b>	12	4.0
	<b>Edo</b>	3	1.0
	<b>Delta</b>	2	.7
<b>Highest Level of Education</b>  <b>n = 290</b>	<b>First school living certificate</b>	4	1.4
	<b>Junior wasce</b>	1	.3
	<b>Senior wasce</b>	246	84.8
	<b>University degree /It's equivalent</b>	30	10.3
	<b>Masters</b>	3	1.0
	<b>PhD</b>	6	2.1

The majority of the population were between ages 21 – 30 (65.7%), there were more females than males (64.7% vs 35.3% respectively), most of the population were students, Christians and single (87.7%, 98.7%, and 91.1% respectively), with Igbo ethnicity being predominant (93.6%).

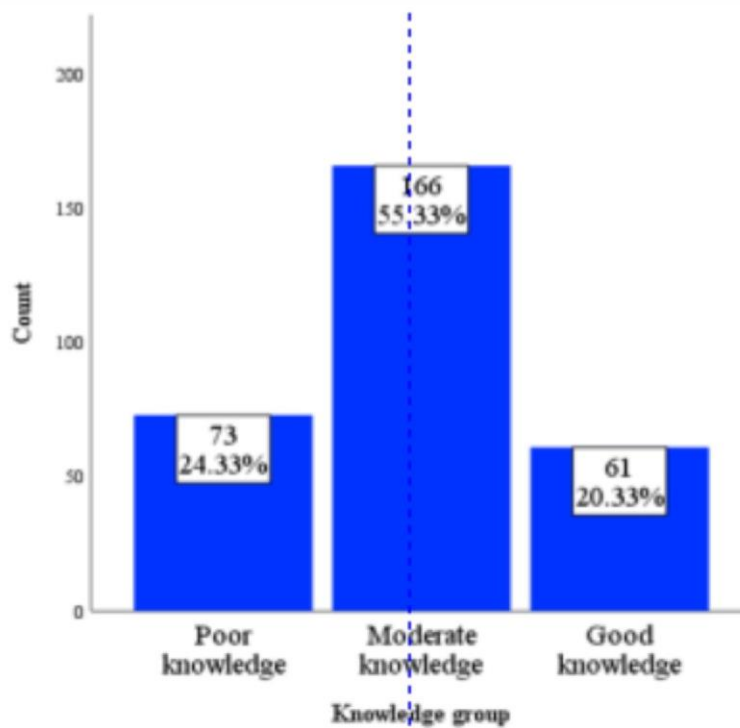


Fig. 1. A Bar graph showing the distribution of knowledge of the population about COVID-19 and COVID-19 vaccines.

The knowledge was calculated using a composite scoring system and the composite score for knowledge had a maximum score of 28. The scores were divided based on the blooms cut-off scoring system which divides the total score as follows: 0 – 59% (0 – 16) represented poor knowledge, 60 – 79% (17 – 21) represented moderate knowledge, and 80 – 100% (22 – 28) represented good knowledge.<sup>47</sup>

Minimum knowledge score was 5, the maximum was 28, the mean was 18.65 (S.D. = 4.11) (66.6%).

While 20.33% of the population and 71.33% of the population had **good** and **moderate** levels of knowledge respectively of COVID-19 and its vaccine, 8.33% had a **poor** level of knowledge.

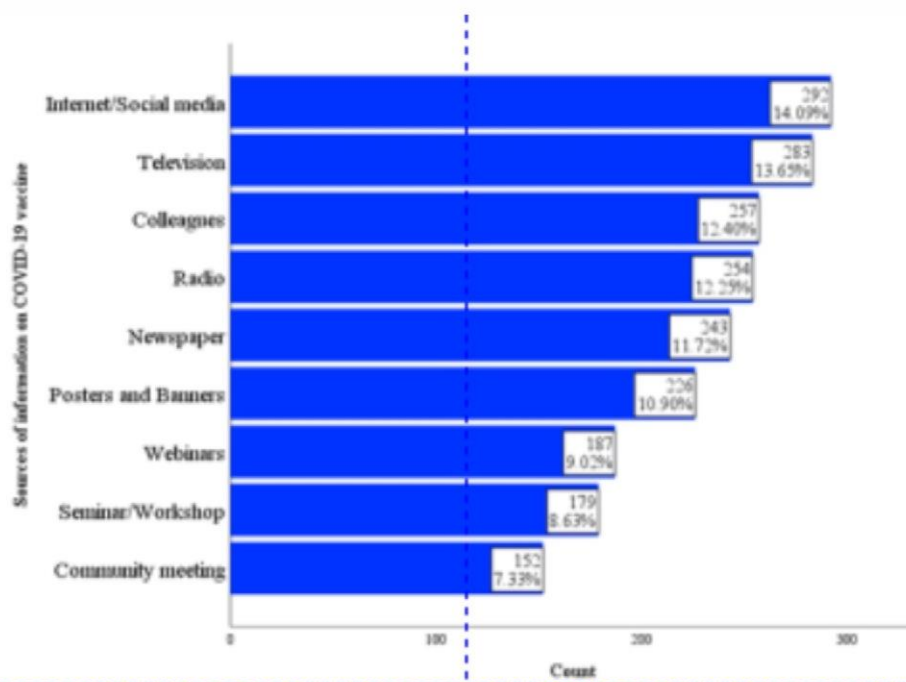




Fig 2. Bar chart showing sources of information about the COVID-19 vaccine

The internet/social media represented the most popular source of information about COVID-19 vaccine, closely followed by television.

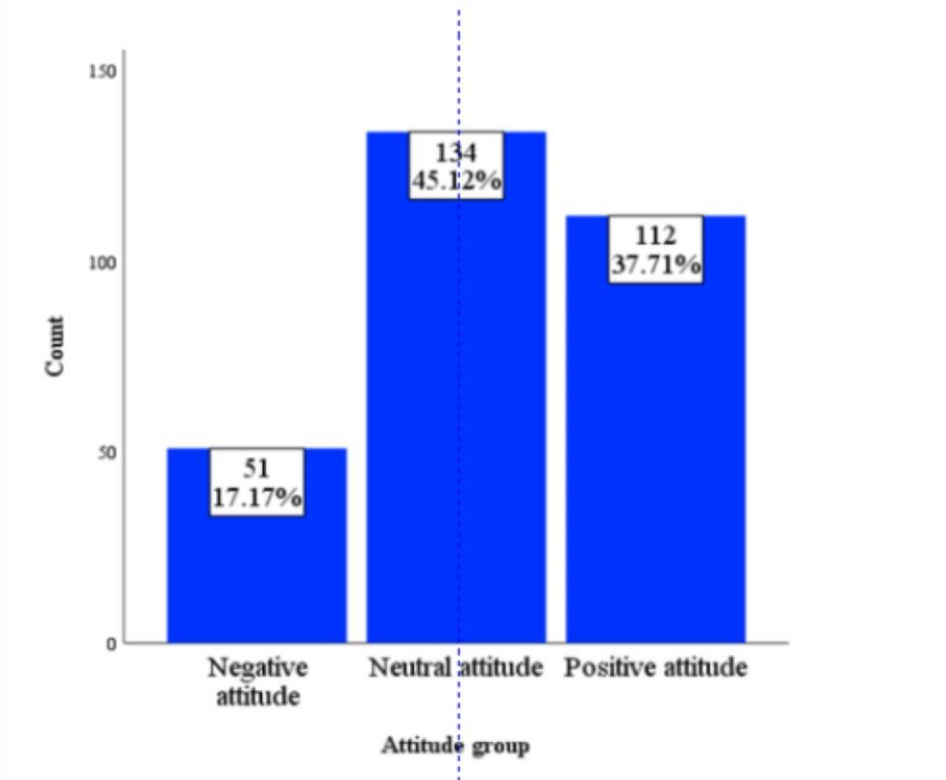


Fig 3. A simple bar chart showing the attitude of the population towards COVID-19 vaccination

The attitude was calculated using a composite scoring system and the composite score for attitude had a maximum score of 30. The scores were divided based on the blooms cut-off scoring system<sup>47</sup> which divides the total score as follows: 0 – 59% (0 – 17) represented negative attitude, 60 – 79% (17 – 23) represented neutral attitude, and 80 – 100% (24 – 30) represented positive attitude.

While 37.71% of the population and 45.12% of the population had **positive** and **neutral** attitudes respectively toward COVID-19 vaccination, 17.17% had a **negative** attitude towards COVID-19 vaccination.

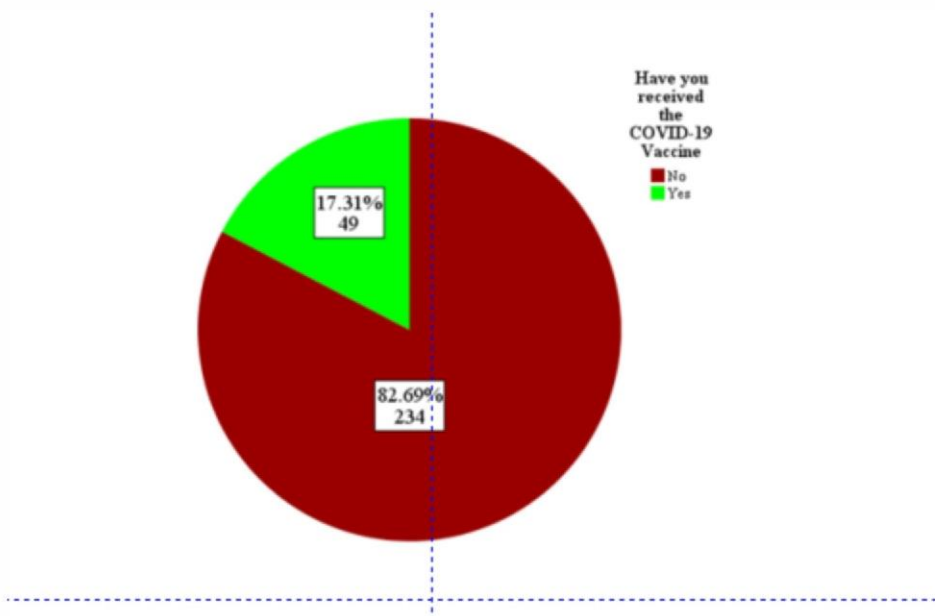


Fig 4. A simple pie chart showing the level of COVID-19 vaccine coverage amongst members of the University of Nigeria, Enugu Campus community.

While 17.31% (49) of the population have been vaccinated, 82.69% (234) haven't received the vaccine.

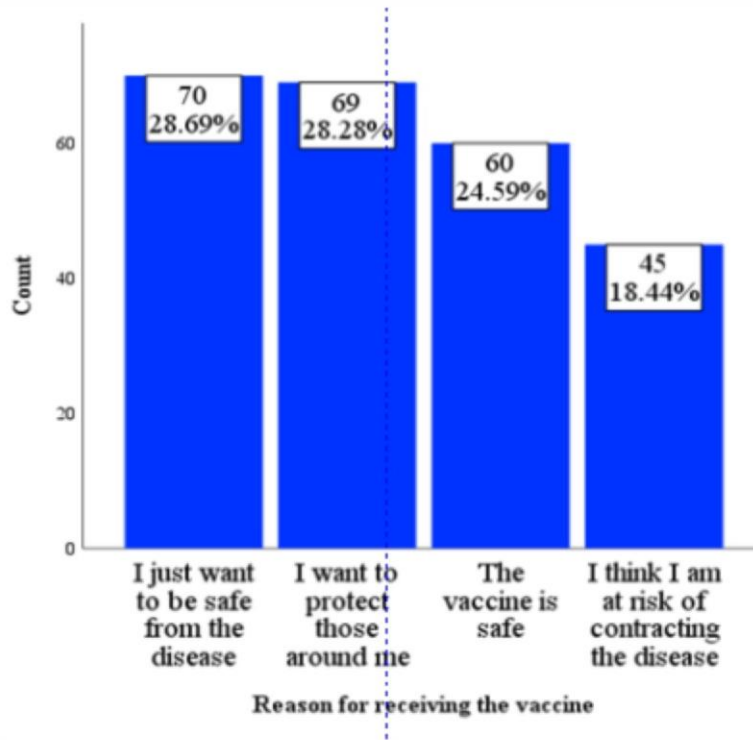


Fig 5. A simple bar graph showing reasons for receiving the COVID-19 vaccine.

Of those that have received the vaccine, wanting to be safe was the most common reason for receiving the vaccine (28.69% (70)), 'to protect those around me' was the second most common reason (28.28% (69)), 24.59% (60) of them had 'the vaccine is safe' as their reason and 18.44% (45) took the vaccine because they thought they were at risk of contracting the disease.

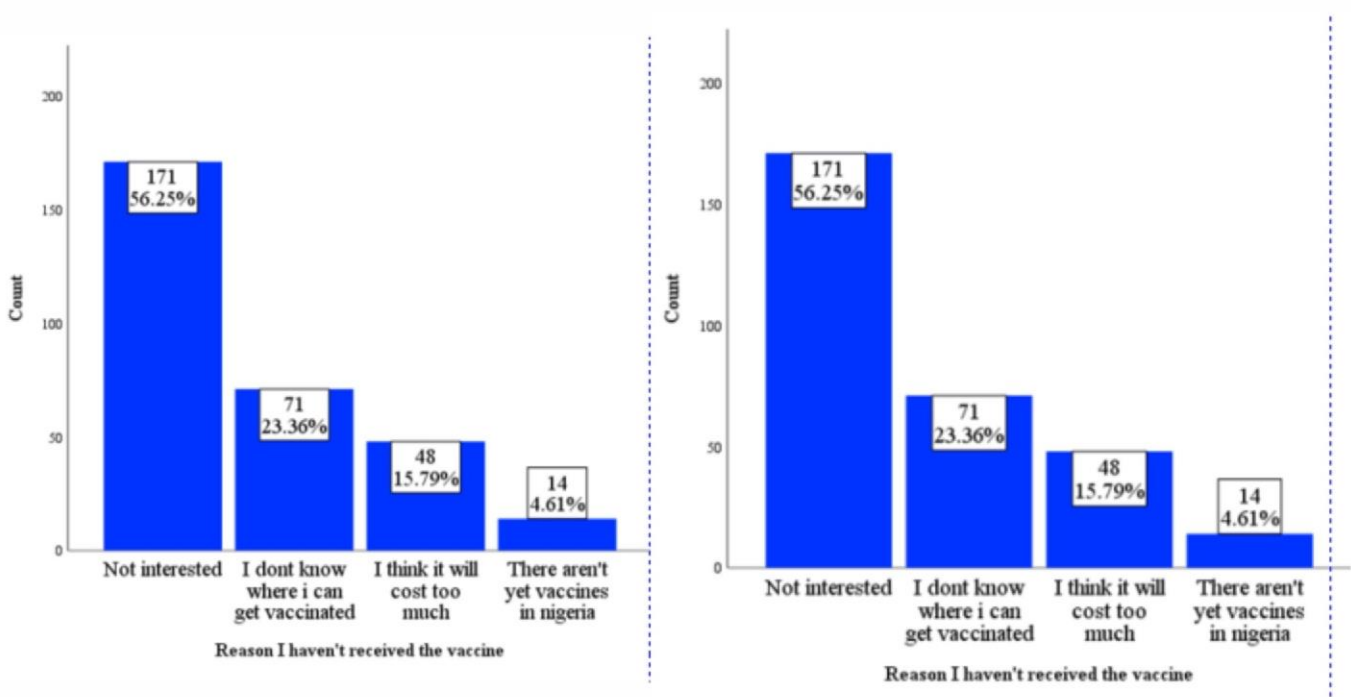


Fig 6. Simple bar graph showing reasons for not having received the COVID-19 vaccine.

The most common reason was by far non-interest in taking the vaccine (56.25% (171)), followed by ignorance of where to get the vaccine (71 (23.36%)), thinking the vaccine is costly (15.79% (48)), and ignorance of the presence of vaccines in Nigeria (4.61% (14)).

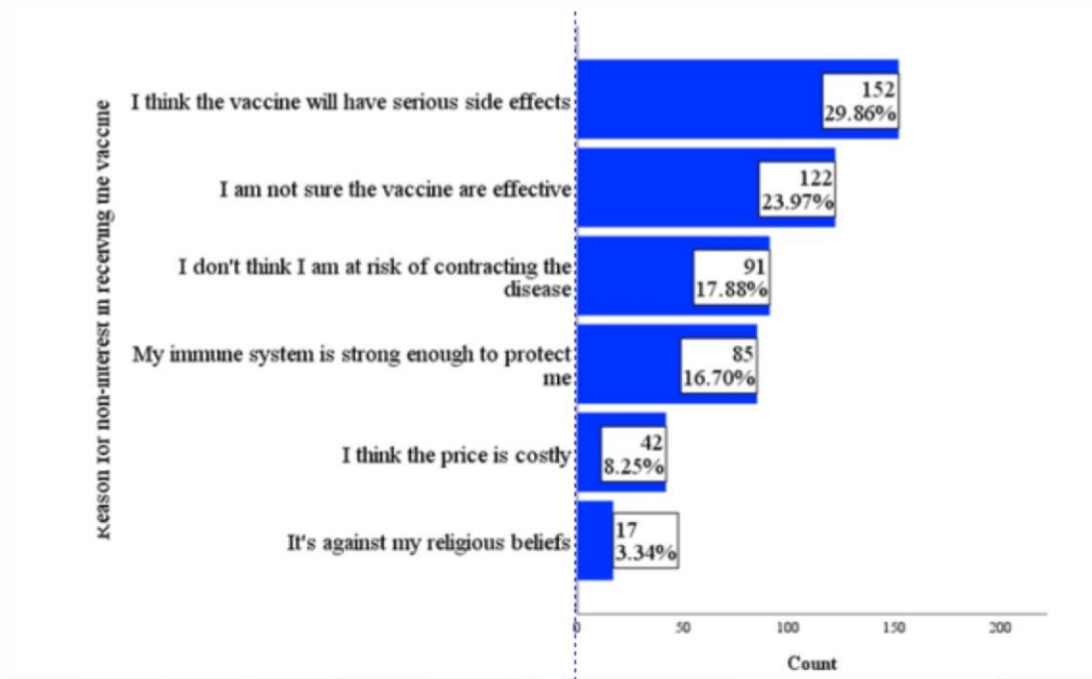


Fig. 7. Bar chart showing reasons for non-interest in receiving the COVID-19 vaccine.

The most common reason for non-interest was the belief that the COVID-19 vaccine would have serious side-effects (29.86%), followed by doubts about the effectiveness of the vaccine (23.97%), doubts about personal risk of contracting the disease (17.88%), belief in their immune system (16.70%), cost of the vaccine (8.25%), and religious belief (3.34%).

Table 2a. Factors affecting attitude towards COVID-19 vaccine. (Numerical variables)

Variable	Statistic	p-value
Age	Pearson's R = 0.195	0.001*
Knowledge score	Pearson's R = 0.008	0.895

Table 2b. Factors affecting attitude towards COVID-19 vaccine. (Categorical variables)

Variable	Mean Attitude score	Std. Dev.	Statistic	p-value

Sex	Male (106)	21.99	4.700	t = 0.911	0.363
	Female (191)	21.47	4.785		
Occupation	Student (260)	21.67	4.886	F = 3.469	0.032*
	Lecturer (21)	19.76	3.223		
	Security (16)	23.88	3.074		
Marital status	Single (268)	21.46	4.835	t = -2.562	0.011*
	Married (25)	24.00	3.428		
Level of education	WASSCE and below (249)	21.71	4.770	t = 0.734	0.464
	University degree and above (38)	21.11	4.781		
Knowledge of someone that had COVID-19 disease	Yes (120)	22.22	4.910	t = 1.435	0.152
	No (151)	21.38	4.676		
Knowledge of someone that died from COVID-19 disease	Yes (77)	23.23	4.939	t = 3.005	0.003*
	No (190)	21.34	4.560		
Any member of household with COVID-19	Yes (50)	20.52	5.015	t = -2.042	0.042*
	No (222)	22.04	4.698		
Had COVID-19 in the past	Yes (27)	21.70	4.818	t = -0.133	0.894
	No (240)	21.83	4.797		

\*Significance represents p-value less than 0.05

A positive correlation was found between Age and attitude towards COVID-19 vaccination,  $r(282) = 0.195$ ,  $p = 0.001$ , thus, the older the age, the better the attitude towards COVID-19 vaccination.

Occupation was found to be a significant factor associated with attitude towards COVID-19 vaccine, ( $F = [3.469]$ ,  $p = 0.02$ ). Tukey's HSD test for multiple comparisons found that the mean value for attitude score was significantly different between Lecturers and Security Men ( $p = 0.024$ , 95% C.I. =  $[-7.80, -0.43]$ ), with Security men more likely to have a better attitude towards COVID-19 vaccination than lecturers.

There was no statistically significant difference in mean attitude scores between Students and Lecturers ( $p = 0.177$ ), and Students and Security Men ( $p = 0.166$ ).

Marital status was found to be significantly associated with attitude towards COVID-19 vaccination.

There was a significant difference between single marital status ( $M = 21.6$ ,  $SD = 4.835$ ) and married status ( $M = 24.00$ ,  $SD = 3.428$ );  $t(291) = -2.562$ ,  $P = 0.011$ .

Thus, the married are more likely to have a better attitude to COVID-19 vaccination than the single.

Knowledge of someone who died from COVID-19 disease was found to be significantly associated with attitude towards COVID-19 vaccination.

There was a significant difference between those who know someone who has died from COVID-19 disease ( $Mean (M) = 23.23$ ,  $SD = 4.939$ ) and those who don't know anyone who has died from COVID-19 disease ( $M = 21.34$ ,  $SD = 4.560$ );  $t(265) = 3.005$ ,  $P = 0.011$ .

Thus, those who know someone who has died from COVID-19 disease have a better attitude to COVID-19 vaccination than those who don't know anyone who has died from COVID-19 disease.

Having a member of one's household who has had COVID-19 disease was found to be significantly associated with attitude towards COVID-19 vaccination.

There was a significant difference between those who have a member of their household who has had COVID-19 disease ( $M = 20.52$ ,  $SD = 5.015$ ) and those who don't have a member of their household who has had COVID-19 disease ( $M = 22.04$ ,  $SD = 4.698$ );  $t(270) = -2.042$ ,  $P = 0.042$ .

Thus, those who have a member of their household who has had COVID-19 disease have a poorer attitude to COVID-19 vaccination than those who don't have a member of their household who has had COVID-19 disease.

Table 3a. Factors affecting receipt of COVID-19 vaccine (Numerical variables)

Variable		Mean	SD	<i>t</i>	P-value
<b>Age in Years</b>	<b>Yes (46)</b>	29.41	11.716	5.542	0.000*
	<b>No (222)</b>	23.15	5.529		
<b>Knowledge score</b>	<b>Yes (49)</b>	20.65	4.863	2.729	0.007*
	<b>No (234)</b>	18.73	4.413		
<b>Attitude score</b>	<b>Yes (49)</b>	24.35	4.323	4.551	0.000*
	<b>No (234)</b>	21.02	4.722		

Table 3b. Factors affecting receipt of COVID-19 vaccine (Categorical variables)

Variable		Yes	No	$\chi^2$	P-value
<b>Sex</b>	<b>Male</b>	24 (23.5%)	78 (76.5%)	4.303	0.038*
	<b>Female</b>	25 (13.8%)	156 (86.2%)		

<b>Occupation</b>	<b>Student</b>	31 (12.6%)	215 (87.4%)	29.191	0.000*
	<b>Staff</b>	18 (48.6%)	19 (51.4%)		
<b>Marital status</b>	<b>Single</b>	34 (13.3%)	221 (86.7%)	17.128	0.000*
	<b>Married</b>	11 (45.8%)	13 (54.2%)		
<b>Education</b>	<b>WASSCE and below</b>	31 (13.2%)	204 (86.8%)	16.127	0.000*
	<b>University degree and above</b>	15 (39.5%)	23 (60.5%)		
<b>Do you know any one that came down with the COVID-19 disease</b>	<b>Yes</b>	26 (22.0%)	92 (78.0%)	9.240	0.002*
	<b>No</b>	12 (8.6%)	128 (91.4%)		
<b>Do you know anyone that has died from COVID-19 disease</b>	<b>Yes</b>	17 (22.4%)	59 (77.6%)	4.678	0.031*
	<b>No</b>	21 (11.8%)	157 (88.2%)		
<b>Has any member of your household come down with COVID-19 disease</b>	<b>Yes</b>	12 (24.0%)	38 (76.0%)	4.307	0.038*
	<b>No</b>	26 (12.4%)	183 (87.6%)		
<b>Have you come down with COVID-19 in the past</b>	<b>Yes</b>	7 (25.9)	20 (74.1%)		
	<b>No</b>	31 (13.7%)	196 (86.3)	2.855	0.091

\*P-values less than 0.05 are regarded as significant, hence the null hypothesis is rejected.

On running a chi-squared analysis of factors affecting receipt of COVID-19 vaccine, Age, level of knowledge, attitude, sex, occupation, marital status, level of education, knowledge of someone that had the disease or died from it were all variables associated with receipt of the COVID-19 vaccine.

Table 4: Logistic regression table bearing the variables with significant associations with receipt COVID-19 vaccine.

	<b>B</b>	<b>S.E.</b>	<b>Wald</b>	<b>df</b>	<b>Sig.</b>	<b>Exp(B)</b>	<b>95% C.I. for EXP(B)</b>	
							<b>Lower</b>	<b>Upper</b>
<b>Age in Years</b>	-.107	.095	1.280	1	.258	.898	.746	1.082
<b>Sex(1)</b>	.329	.532	.382	1	.537	1.390	.490	3.944

Marital status(1)	1.560	1.318	1.401	1	.237	4.757	.359	62.969
Education group(1)	-.707	.810	.762	1	.383	.493	.101	2.413
Occupation(1)	-2.977	2.713	1.204	1	.272	.051	.000	10.380
Knowledgescore2	-.042	.046	.816	1	.366	.959	.876	1.050
Attitude score	-.246	.061	16.421	1	<b>.000*</b>	.782	.694	.881
Do you know any one that came down with the COVID-19 disease(1)	-.983	.568	2.996	1	.083	.374	.123	1.139
Do you know anyone that has died from COVID-19 disease(1)	.372	.509	.534	1	.465	1.451	.535	3.935
Has any member of your household come down with COVID-19 disease(1)	-.628	.573	1.202	1	.273	.534	.174	1.639

\*p < 0.05 is significant, hence the null hypothesis will be rejected.

A binary logistic regression was to assess the effect of different predictor variables on participants' likelihood of not having received the COVID-19 vaccine. The logistic regression model was statistically significant  $\chi^2 = 41.118$ ,  $p = 0.000$ . The model explained 29.5% (Pseudo  $R^2$ ) of the variance seen in the receipt of COVID-19 vaccine, and predicted the responses correctly 87.4% of the time.

Adjusting for other variables in the model, only attitude towards COVID-19 vaccination was found to significantly affect receipt of covid-19 vaccine ( $p = 0.000$ ).

It was found that holding other variables in the model constant, the odds of not taking the COVID-19 vaccine reduced by **78.2%** (Adjusted odds ratio (AOR) = **0.782**, 95% C.I. **0.694**, **0.881**) for every additional point in attitude score.

Thus, a better attitude towards COVID-19 vaccination is associated with higher odds of having received the COVID-19 vaccine.

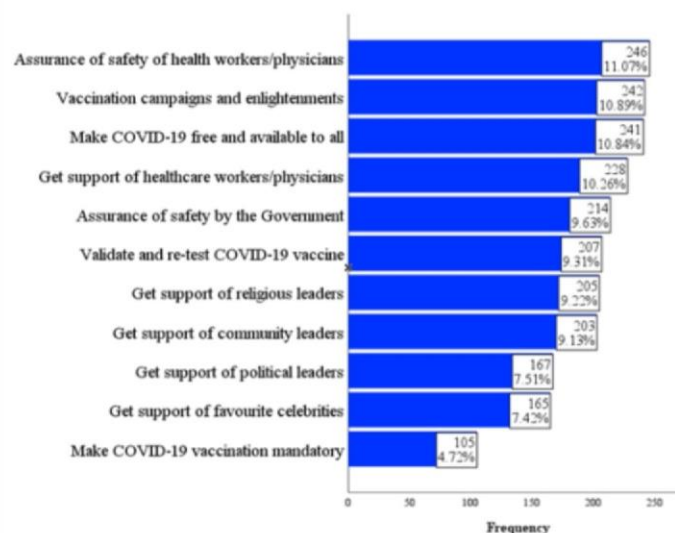


Fig. 8. Suggested measures that could be taken to improve COVID-19 uptake

## DISCUSSION

### Knowledge of COVID-19 and COVID-19 Vaccination

The level of knowledge of COVID-19 and COVID-19 vaccines was found to be lower than what is obtainable in other developed countries. This fact has negative public health connotations. People less likely to go forward to take the COVID-19 vaccine if there are a lot of gaps in their knowledge of COVID-19 and its vaccine and this could be seen from the comparatively higher hesitancy rate seen in our population as compared to developed countries.

The mean knowledge score was found to be **18.65 (S.D. = 4.11) (66.6%)**. This is lower, than the knowledge score found in study carried out in Vietnam in January 2021, that revealed that most of the participants had good knowledge about COVID-19, with a mean knowledge score of 7.11 out of 9, (79%).<sup>32</sup> The discrepancy may be partly due to the fact that we also tested our study population for knowledge about COVID-19 vaccines in addition to knowledge about COVID-19 disease.

The results showed that 55.33% of our respondents have moderate knowledge of COVID-19 and COVID-19 vaccination, 20.33% have good knowledge and 24.33% have poor knowledge of the virus and vaccination against it. The result is poor considering that a study in Bangladesh which was published on the 9th of September 2021 revealed that 39.67% of their respondents had good knowledge, 44.97% of their respondents had medium knowledge and 16.36% had little knowledge of COVID-19 virus and COVID-19 vaccination.<sup>33</sup>

The reason for this could be due to the fact that we used the Bloom's cut off point for dividing our knowledge scores into groups, with smaller proportions of the total possible scores being in the good and moderate knowledge groups as compared with the poor knowledge group (0 – 59% (0 – 16) represented poor knowledge, 60 – 79% (17 – 21) represented moderate knowledge, and 80 – 100% (22 – 28) represented good knowledge).

These results have public health implications, as a poor knowledge of the COVID-19 and its vaccine could have a negative impact on vaccine uptake.

### Attitude towards COVID-19 vaccine

Attitude towards the COVID-19 vaccine was generally found to be poor and the public health implication of this is that, the poor attitude towards the COVID-19 vaccine will and as shown from our study, lead to poor uptake of the vaccine, leaving much of the population at risk to the virus if it resurges or an outbreak is caused by a more virulent strain of the virus.

Our result also showed 45.12% of respondents having a neutral attitude to vaccination, 37.71% showing a positive attitude and 17.16% showing negative attitude towards COVID-19

vaccination.

When asked if respondents were willing to take the vaccine, 23.8% were unwilling to take it, and 41.5% were neutral with only 34.7% of the population willing to take the vaccine. This yielded a hesitancy rate of 65.3%. This is poor compared to the result of a study conducted among undergraduates in Italy in May 2021 where 91.9% said they will take the vaccine if it becomes available<sup>31</sup> and an Australian study carried out between April 17-21 2021 where 85.5% were willing to take the vaccine if made available.<sup>36</sup>

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## Factors Affecting Adherence To Anti-retroviral Drugs Among HIV Patients In A Tertiary Health Facility In South East, Nigeria.

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### ABSTRACT

**Aim/Objective:** To ascertain the factors affecting the adherence to anti-retroviral drugs amongst HIV patients receiving special care in a tertiary health facility in South East, Nigeria.

**Methodology:** A cross-sectional descriptive study was done amongst patients living with HIV/AIDS receiving special care in the HIV/AIDS Clinic of UNTH. Systematic sampling, a probability sampling technique was adopted to recruit 321 respondents. The survey instrument was a semi-structured, interviewer-administered questionnaire consisting of four sections designed to elicit desired information from the respondents.

**Result:** Successful anti-retroviral treatment is dependent on sustaining very high levels of adherence and this remains a challenge that has important implications. A total of 321 patients living with HIV were studied (85 males and 236 females) with a mean age of 44.5 years and a modal age of 48 years and above. The level of knowledge amongst these patients was 92.2% representing about 29 percent increase when compared to previous studies. Majority of the respondents had a positive attitude towards ARTs (78.2%). The adherence rate was pegged at 62.3% which is relatively good when compared to some other studies. A third of the respondents who missed their doses did so because of forgetfulness while the high cost of transportation to the clinic was a significant reason for them missing their clinic appointments.

There was a significant association between knowledge and adherence to ART ( $p=0.005$ ), as well as with age of respondents ( $p=0.001$ ), there was also a significant relationship between the attitude of the respondents towards the use of ART and age ( $p=0.001$ ).

**Conclusion:** There should be further emphasis on good adherence during counselling sessions. Make-shift ART treatment centers can be provided to reduce transportation cost for financially handicapped patients. Men should be counselled on better health seeking behaviour. Finally, the use of memory aids should be encouraged amongst patients who forget to take their drugs.

This could help to improve their rate of adherence and produce better outcomes.

### Background

Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome, HIV/AIDS pandemic is one of the most serious health and socioeconomic problem facing Nigeria.

It was widely believed to have originated in Kinshasa, in the Democratic Republic of Congo around 1920 when HIV crossed species from chimpanzees to humans.<sup>1</sup>

The first two HIV cases in Nigeria were diagnosed in 1985 and reported in 1986 in Lagos, one of which was a young female sex worker aged 13 years from one of the West African countries<sup>2</sup>.

Recent epidemiological data shows that HIV remains a public

health issue. In the year 2019, the global burden of HIV/AIDS was put at 36.9 million, corresponding to about 0.5% of the world's population, with a prevalence rate of about 476 cases per 100,000<sup>3</sup>.

Nigeria has the second largest HIV epidemic in the world<sup>2</sup>. As of 2020, 1.7 million people in Nigeria were living with HIV. That year, the number of deaths due to AIDS amounted to 49 thousand, including both adults and children. The highest number of deaths was recorded among male adults, with 20 thousand deaths<sup>4</sup>.

The Human Immunodeficiency Virus (HIV) targets the immune system particularly the CD4 helper cells and therefore weakens people's defense against many infections<sup>5</sup>. The symptoms of this disease are very diverse and differ from person to person. The symptoms are also dependent on the stage of the disease<sup>5</sup>. It ranges from common symptoms as chill, rash to rare symptoms like rapid

weight loss, recurring fever or profuse night sweats, prolonged swelling of the lymph glands, diarrhoea that lasts for more than a week and other neurologic disorders<sup>5</sup>.

Owing to the dangerous nature of this health challenge, there was a need to find a good solution. It was at this point that Anti-retroviral therapy was introduced. It is generally perceived that the therapy and care of people living with HIV requires far reaching reconciliation of patient focused clinical and social administrations. Early diagnosis, acceptance of one's status, correct use of anti-retroviral therapy, management of any complications are all remarkable parts of effective clinical management geared towards ensuring that persons living with HIV/AIDS get a better quality of life<sup>6</sup>.

The introduction of Antiretroviral therapy (ART) amongst patients living with HIV is a huge step that has been shown to delay progression to Acquired Immune Deficiency Syndrome (AIDS) but does not cure the disease. This has resulted in a more sustained and greater virologic and immunologic response and an increased quality, length of life, and productivity of people living with HIV<sup>7</sup>.

In a bid to help alleviate the health burden associated with HIV/AIDS, there was a need to ensure that anti-retroviral therapies cut across so many countries particularly, the developing ones. So many global health initiatives like the United States (US) President's Emergency Program for AIDS Relief (PEPFAR) and the Global Fund to fight AIDS, Tuberculosis and Malaria (GFTAM) responded to the pandemic by expanding the provision of ART to the increasing number of affected patients<sup>8</sup>. This resulted in the expansion of treatment and prevention programs that have increased ART access to previously un-served and underserved populations. Nigeria is one of the target countries for these international programs and is also a country with strong local political support for these initiatives<sup>9</sup>.

Notwithstanding these efforts to ensure that these therapies are accessible to those who need it, adherence to ART has been another major problem of concern. Success with any medication depends not only on the intrinsic properties of the drugs, but also on the ability of the patient to take the medication correctly. Thus, successful anti-retroviral treatment is dependent on sustaining very high levels of adherence. To achieve this, there must be a strong relationship that cuts across the patients, their families, the health care system, government, NGOs and the society at large.

According to the World Health Organization, adherence can be defined as "the extent to which a person's behavior – taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider"<sup>10</sup>. In other words, it can be seen to be a patient's ability to stick to a treatment plan, take drugs at the prescribed times and frequencies, and adhere strictly to all restrictions placed on food and medications. It is widely accepted that a person taking ART

medicines must take at least 95% of the prescribed doses and within good adherence time of 1hr in order to attain an undetectable viral load and avoid the development of treatment resistance<sup>11</sup>. Below this level, treatment failure rate increases.

HIV has been a major public health problem in Nigeria after the first case was reported. Recent studies show that about 41% of persons who live with HIV in Nigeria come from six different states; Kaduna, Akwa-Ibom, Benue, Lagos, Oyo and Kano<sup>12</sup>. However, the highest prevalence is found in the South-South zone and stands at 5.5% while the lowest is found in the South Eastern Zone with a prevalence of about 1.8%<sup>12</sup>. In a bid to help control the HIV/AIDS infections, the Federal Government of Nigeria in 2001 initiated the National Anti-retroviral Therapy Programme<sup>13</sup>. However, implementation started in February 2002 in about 25 tertiary institutions in the six geo-political zones of the country. The aim of this programme was to reach out to 10,000 adults and 5,000 children who were living with HIV<sup>13</sup>. Even in the advent of numerous challenges not limited to funding, poor adherence, poor healthcare system and other socio-cultural challenges, this programme has evolved over the years and currently has about 1,048,805 people living with HIV on Anti-retroviral therapy<sup>13</sup>.

The overall goal of this programme has been to reduce HIV related morbidity, mortality and reduce the impact of the AIDS epidemic by making sure all persons living with HIV get quality treatment services for AIDS and opportunistic infections that come with it.

Nigeria, despite these efforts is still a long way off meeting the global target of enrolling about 90% of diagnosed HIV patients into her Anti-retroviral therapy programme<sup>12</sup>. Adherence to anti-retroviral therapy still seems to be a huge bottle neck in the control of the disease.

### Statement of the problem

Nigeria has the second largest epidemic in the world<sup>2</sup>. In the year 2019, the global burden of

HIV/AIDS was put at 36.9 million, corresponding to about 0.5% of the world's population, with a prevalence rate of about 476 cases per 100,000<sup>3</sup>. Adherence has remained a major challenge in Nigeria despite all the efforts that have been put to control the spread of HIV. Non-adherence issues have been common especially in sub-Saharan African countries.

It is not fully known why the patients find it hard to reach the recommended near perfect adherence levels of or above 95 per cent and therefore, there is need to establish this. If these factors that affect adherence are not properly identified and speedily solved, there may be a possibility of developing antiretroviral resistance in some of these patients and of course, limit the treatment options available to them.

Some studies have shown that the large number of pills to be taken every day and their associated side effects are factors that affect

adherence<sup>14</sup>. In other to relieve this pill burden or side effects, some of these patients end up reducing the number of pills they take or in worst case scenario, discontinue their regimen entirely<sup>14</sup>. Some may also find it difficult to fit the ART regimen in their life situations resulting to a lot of disruptions, stresses. Such inconveniences may make them skip some doses of the ART regimen.

In addition to food and fluid restrictions,<sup>15</sup> so many other factors like poor knowledge of ARTs, forgetfulness, poor understanding of the relationship between non-adherence and disease progression, alcohol and drug abuse, poor social support, poor knowledge of HIV/AIDS, poor health provider-patient relationships, being away from home, fear of disclosure and poor educational background have all been seen to affect adherence<sup>16</sup>. These factors need to be addressed so that patients are empowered and enlightened more on the importance of maintaining high ART adherence levels and the implications of non-adherence.

The society also has a fair share to contribute as stigmatization and discrimination are still much alive in Nigeria. Patients living with HIV will find it difficult to disclose their sera-status as they may be treated horribly by the society. Those who even get the drugs, may take them in hiding and in worst cases, may miss out of their drug regimen when they are with people.

### Justification of the study

Despite the numerous studies that have been done to access the factors that affect adherence to antiretroviral therapy amongst persons living with HIV within and outside Nigeria, it is hoped that the findings of this study will offer valuable contributions to solving this menace of nonadherence amongst HIV patients receiving ARTs.

The results generated from this study will make several concrete contributions to both the knowledge and understanding of what is one of the worst health care challenges in Nigeria and the world at large. This result will contribute to the understanding of non-adherence, particularly the factors that affect it and will be useful in developing interventions that will take into consideration the problems faced by people taking ARTs in South Eastern Nigeria.

Quantitative data collected in this study will be made available to health planners such as the Ministry of Health and it is hoped that this will surely be a lead way to a better designed, better directed and more culturally sensitive intervention programmes and policies to deal with all problems with non-adherence.

Some of the burning issues answered in this study may be incorporated immediately to address urgent problems that may not require scientific inquiry at any hospital in Nigeria.

Finally, it is hoped that the findings of this study will help to reduce the rate of morbidity and mortality amongst HIV patients receiving

special care in Nigerian Hospitals.

Against this background, this study aims to identify more comprehensively the factors affecting antiretroviral treatment adherence among persons living with HIV/AIDS in Nigeria.

### General objectives

To ascertain the factors affecting the adherence to anti-retroviral drugs amongst HIV patients receiving special care in a tertiary health facility in South East, Nigeria.

### 1.5 Specific objectives

1. To determine the level of knowledge of anti-retroviral drugs amongst HIV patients.
2. To know the prevalence of non-adherence to anti-retroviral therapy.
3. To identify the various factors that affect the adherence to anti-retroviral drugs amongst HIV patients.
4. To determine the attitude of patients towards HIV drugs in a tertiary health facility in South East, Nigeria.

## LITERATURE REVIEW

### Determination of the Level of Knowledge of Antiretroviral drugs amongst HIV patients.

There is a significant variation in the level of knowledge of antiretroviral drugs amongst patients who take ART in different parts of the world.

A study conducted in Vietnam<sup>17</sup> showed that the proportion of patients with a general knowledge of ART treatment was relatively high (62%), with a mean score of  $8.2 \pm 1.4$  (SD) out of 9 correct. Most (>90%) of these participants were aware that ARTs were antiviral medicine, and were also aware of its side-effects, the management of these side-effects, and the calculation of subsequent doses<sup>17</sup>. Similarly, another study conducted by Nachege et al<sup>18</sup> in South Africa, showed that the mean ART knowledge score was 7.9 out of 11 correct, or 72% (95% CI: 69%, 74%)<sup>18</sup>. The result showed that most participants correctly agreed that ARTs could prevent disease progression (98%) and vertical transmission (90%) and could control HIV (88%). A sizable minority believed that ART could cure HIV (49%) and that ART would not cause side effects (36%).

Recent studies in Africa have revealed a suboptimal medication Knowledge and adherence of about 77%<sup>19</sup>. This study was comparable with what was obtained in a similar work in Uganda<sup>20</sup>, 78.2%, but far lower than the 96.0%, 98.1% found among Ethiopians<sup>21</sup> and Tanzanians<sup>22</sup> on HAART respectively.

In contrast to these other African studies, in the University of Port Harcourt Teaching Hospital, Nigeria it was found that less than half of the respondents (40.5%) knew the drugs that they were

taking while 51.0% had no idea about the drugs. Evaluation of the knowledge of the drugs by the respondents indicated that 64.1% knew the drugs were not a cure for HIV while 18.7% believed the drugs had the ability to cure the viral disease. There were varied answers to the knowledge of specific function of the drugs with only 35.3% of the respondents aware that the HAART reduced viral load<sup>23</sup>. Despite these, it was still found that there was an adherence rate of about 64.1% in patients who were on ARTs in UPTH.

A total of 4 facilities in South Eastern Nigeria<sup>24</sup>, offering ART services were selected for an intervention study involving a before and after comparison of the knowledge and adherence pattern to ART in PLWHAs; University of Nigeria Teaching Hospital, Enugu State University Teaching Hospital, Annunciation Specialist Hospital and Mother of Christ Specialist Hospital. Out of the 4 selected ART hospitals in Enugu metropolis, 2 served as the intervention centers while the other 2 served as the control centers.

The study showed the respondents' knowledge of the nature of HIV/AIDS disease at baseline and post intervention. At baseline, over 80% of the study and control groups identified AIDS as a serious disease, that persons with HIV can still live active life and demonstrated the need for routine HIV screening during pregnancy. This was not statistically significant. However, knowledge of availability of drugs for HIV treatment was statistically significant among PLHWA in study group than those in the control group at baseline.

Post-intervention, there was increased knowledge of the nature of HIV/AIDS disease among the study when compared with the control group. The difference in knowledge among all variables was statistically significant<sup>24</sup>.

### Prevalence of non-adherence to ARTs

The prevalence of non-adherence to ARTs vary from place to place, as various factors that affect adherence to ARTs differ from place to place.

Research studies conducted amongst people living with HIV in the developing and developed countries surprisingly showed that patients in the developing countries had a better adherence rate to ARTs than their counterparts in the developed countries. This was shown in a multicountry analysis done in North America and Sub-Saharan Africa<sup>25</sup>. In this study it was shown that there was a non-adherence prevalence rate of about 45% in North America and about half of that rate (22.7%) in Sub-Saharan Africa.

Despite the better adherence rates obtained in Africa when compared to North America, two different Nigerian studies conducted by Olowookere<sup>26</sup> and Ugochukwu<sup>27</sup> in the South Western and South Eastern part of the Nigeria respectively, however, recorded high non-adherence rates of about 62.9% and

75% respectively. Even with a better adherence rate in Africa, these rates are quite suboptimal and still pose a serious problem in the control and spread of HIV/AIDS infections.

Two other set of studies done in two different health institutions in the North-Central part of Nigeria showed slight variations. It was observed that in Aminu Kano Teaching Hospital<sup>28</sup>, there was an adherence rate of about 54% compared to the 62.6% adherence rate observed in the Federal Medical Centre, Markudi<sup>29</sup>.

Furthermore, recent research studies conducted at different tertiary health facilities in the country amongst HIV positive pregnant women have shown some variations. At Nnamdi Azikiwe Teaching Hospital, Nnewi, it was observed that about 21.7% non-adherence rate was prevalent<sup>30</sup> while about 10.8% non-adherence rate was found to prevail at the Federal Teaching Hospital Abakaliki<sup>31</sup>.

### Factors affecting adherence to ARTs amongst HIV patients

Numerous international and local studies have been done in the past to identify the factors that affect adherence to ART with the end goal of improving adherence amongst PLWHA. These factors are numerous. However, to make this work easier to understand and comprehend, these factors have been broadly broken down into three categories<sup>32</sup>.

1. Patient related factors
2. Disease related factors
3. Health worker relationship factors

#### Patient-Related Factors

##### *Pill burden*

Pill burden also significantly affected adherence in a study conducted in Cross River, Nigeria. Respondents on more than two pills per day were less likely to adhere to their treatment compared to those on at least two pills per day<sup>33</sup>. This finding was also identified as a significant predictor of adherence in a study done by Falang et al<sup>34</sup> in Jos.

##### *Financial Constraints*

Lack of money for transportation was identified as a significant factor affecting treatment adherence in a study conducted in Ilorin, Nigeria, 75% of the patients who did not have money for transportation to keep hospital appointment missed their drugs<sup>35</sup>. Lack of money for transportation has been reported in a similar study in Malawi<sup>36</sup>. This study showed that 35% of people on who had a poor adherence to their ART lacked the financial power to transport themselves to the clinic.

##### *HIV-Status Disclosure*

This is another important factor that goes on to affect adherence amongst PLWHA who are on ARTs. A lot of studies conducted on the factors that affect adherence to anti-retroviral have pin pointed the inability to disclose one's HIV status as a huge setback to adhering to anti-retroviral. A study conducted in Tanzania<sup>22</sup> was observed to show that patients who did not disclose their HIV sera status to their sexual partner and even family members were poorly adherent to their drugs.

Similar results were seen in Ibadan<sup>37</sup> and even as far as China<sup>38</sup>, where participants who did not disclose their HIV status were unlikely to adhere to the ARTs meant for them. In such cases, patients are likely to have frequent treatment interruptions since their tablets must be hidden and therefore not taken in the presence of others for fear of being stigmatized. Encouraging voluntary HIV status disclosure in a community with access to ART may help decrease stigma and improve adherence.

### **Forgetfulness**

It's been observed that some patients fail to adhere strictly to their medications because they forgot about it. This can be attributed to the long-term period that they have to take these drugs.

A study conducted by Talam et al<sup>39</sup> documented that 50% of patients on antiretroviral therapies had this issue of forgetfulness. However, this was in sharp contrast to another study by Baltazary<sup>40</sup> where only about 12.2 % of the patients did not take their drugs because they did not remember.

In South Africa, another documentation showed that forgetfulness was found to negatively impact on adherence to anti-retroviral therapy<sup>41</sup>. This was also seen in another study conducted in Nigeria by Olowookere<sup>26</sup>.

### **Disease-Related Factors**

The disease related factors can be broadly classified as either the side effects/ toxicities associated with ARTs or the opportunistic infections associated with HIV/AIDS.

ART adverse drug reactions are an important factor that influences adherence to ART. WHO defines an adverse drug reaction as "a response which is noxious and unintended, and which occurs at doses normally used in humans for the prophylaxis, diagnosis, or therapy of disease, or for modification of physiological function"<sup>42</sup>.

Serious and/or long-term adverse drug reactions can affect adherence to the treatment. There is limited knowledge of how HIV-infected individuals perceive and experience adverse drug reactions to ARTs and how these perceptions and experiences may influence ART adherence<sup>43</sup>.

In Switzerland 28% of persons who participated in a study on the factors affecting adherence attributed their poor adherence to the side effects/toxicities that were associated with the ARTs<sup>44</sup>. Side effects of ARTs were reported in about 18.9% of patients who partook in a study conducted in Australia. In fact, this study showed that it was the second major reason patients had a difficult time adhering to their Anti-retroviral therapy<sup>45</sup>.

In another study conducted in Malawi, it was found that half of the patients who stopped making use of ARTs attributed it to accompanying side effects of the drug<sup>46</sup>. These side effects made some women question the efficiency of the drug.

Also, in another study conducted in South Africa, among pregnant women with HIV/AIDS, this was noted, many women stated that they stopped their medications due to ART side effects. The commonly reported side effects included hallucinations, nausea, vomiting, dizziness, body weakness, insomnia and rashes. Vomiting was the most commonly reported ART side effect<sup>47</sup>. These side effects were the main reason these women were not adherent to their therapy.

This observation was also similar with findings in a study, conducted in Ibadan, where the major reasons for missing therapy reported included side effects/toxicities (35.2%)<sup>48</sup>. Studies conducted in Ilorin<sup>35</sup> and Anambra<sup>36</sup> were also consistent with similar studies above. Results from them showed that 66.7%<sup>35</sup> and 74.2%<sup>36</sup> of the patients studied at Ilorin and Anambra respectively avoided their ARTs due to the numerous side effects that were associated with it.

### **Health-Worker Relationship**

The importance of a good patient-health-care-provider (PHCP) relationship cannot be overstated. It may be an important motivating factor for taking and adhering to complex combination of drug therapies. A good PHCP relationship is one that ensures that the patient does not perceive the health worker as being judgmental, stereotypic or discriminatory especially when it comes to cultural issues and also one where the patient is adherent to their drugs and does not allow the health worker to get frustrated due to their lack of adherence, miscommunication, missed appointments etc.

Participants in a Malawian study stated that poor relationships between health care workers and ART patients contributed to defaulting from ARTs<sup>49</sup>. A strained relationship does not give them the confidence to return to that healthcare worker. Similarly, an Indonesian study also found out that health-care related factors were proven barriers to a successful adherence to ARTs<sup>50</sup>.

### **Attitude towards ARTs**

Past studies have shown that a patient's belief about medication



can to a very large extent have a key role to play in their adherence to that medication<sup>51</sup>, with patients who see ARTs as necessary and important to their long term health being more likely to have a better adherence<sup>52</sup>.

A positive attitude is one that encourages the use of ARTs while a negative attitude is one that limits and discourages its use. Several studies have been conducted in this regard; a study conducted in Lagos by Kasumu<sup>53</sup> showed that about 98.1% of patients who were on ART had a good or positive attitude towards ARTs. Unsurprisingly, it was also observed that most of these patients had a better adherence rate than their counterparts and a positive perception about their healthcare workers<sup>53</sup>. A different study in another part of Nigeria showed that 73.9% of patients had a positive attitude towards ARTs. Similarly, it was seen that most of the respondents with good knowledge about HIV/AIDS and a positive attitude about the disease tended to be more adherence to ART( $p < 0.001$ )<sup>54</sup>.

A study conducted in Madagascar showed that 75.6% of participants had an overall positive attitude/perception towards ART while about 24.6% had a negative attitude towards it<sup>55</sup>. 10% believed other methods were more effective than ART and thus didn't take their drugs seriously while about 42.7% thought that taking ARTs were just shameful<sup>55</sup>. The 75.6% who had a positive attitude were seen to have a better adherence rate to their drugs when compared to their counterparts.

Meanwhile another research work conducted in Zambia showed that 69% of women who had a negative attitude towards ARTs were seen to be poorly adherent to their medications whilst 78% of women who had a positive attitude towards ARTs had a very strong adherence rate<sup>56</sup>.

## RESEARCH METHODOLOGY

### Study Area

Enugu state is one of the five states in the South East Geopolitical zone of Nigeria. It was created on the 27<sup>th</sup> August 1991 from the old Anambra state by a military decree under the then

Military head of state, General Ibrahim Babangida. Its capital city is Enugu, meaning "the top of the hill"<sup>57</sup>, lying partly within the semi-tropical rain forest belt of the south. The state spreads towards the north through a land area of approximately 9827.1km<sup>58</sup>. It is bounded in the south by Abia state, East by Ebonyi state, Northeast by Benue state, Northwest by Kogi state and West by Anambra. The state has 17 Local Government Areas.

It covers a total area of 7,161km<sup>2</sup> (2765 miles) and is 223m (732feet) above sea level. It lies within the subtropical rain forest belt of the south. The mean temperature in Enugu ranges from between 30.6°C (87.16°F) in the hottest month (February) to about 15.0°C (60.5°F) in the coolest month (November) with its rainfall

ranging from 0.16cm<sup>3</sup> 37.5cm<sup>3</sup>. It also has a tropical savannah climate<sup>58</sup>.

The major occupation of the inhabitant ranges from trading and civil services in the urban areas to subsistence farming and animal rearing in the villages<sup>59</sup>. The Enugu metropolis has an estimated total population of about 820,000<sup>60</sup>. 52.1% of which are females and 40% of reproductive age<sup>61</sup>. The population is predominantly Igbo with few other tribes.

The Study Centre will be the HIV Clinic of the University of Nigeria Teaching Hospital (UNTH) Ituku-Ozalla, Enugu. The hospital is a Federal tertiary Health Institution. The new permanent hospital complex at Ituku-Ozalla is located 21 kilometres from Enugu (the Capital of Enugu State), along Enugu-Port Harcourt road<sup>62</sup>. It was recently renovated and equipped under the Federal Government assisted VAMED engineering equipment program. Afterwards, all services rendered at the old site were moved to the new site with effect from 8<sup>th</sup> January 2007 when the former was officially closed. The hospital complex covers an area of about 200 acres and the currently bed capacity is about 704 and has about 41 departments, with 3 outposts located. There are ongoing expansions and development of the hospital within the allocated land space of 747 acres (306 hectares)<sup>62</sup>.

The HIV clinic was established in 2004 as an ART treatment center and is run jointly by the departments of Community of Medicine and Internal Medicine. The center conducts a clinic session four times a week and an average of 200 patients are seen by 5–8 clinicians during this session. It has a counselling unit, a laboratory unit as well as a treatment unit. Patients receive formal pre-treatment adherence education/counselling sessions. They are also expected to visit the center once a month for drug pick-up. Three drugs—Lamivudine (3TC), Nevirapine (NVP) and Stavudine (d4T)—are provided as a combined treatment regimen<sup>27</sup>.

### Study Design

The study was a cross-sectional descriptive study of patients with HIV/AIDS receiving special care in the HIV/AIDS Clinic of UNTH.

### Study Population

The sample population included adults; persons who were above 18 years of age that attend the HIV Clinic and take ARTs from UNTH, Ituku-Ozalla.

### Inclusion Criteria

1. Patients who have taken ARTs from UNTH for at least 3 months.
2. Patients who are more than 18 years old.
3. HIV patients who gave verbal consent to be part of the study.

### Exclusion criteria

1. Persons with age less than 18 years.

2. Persons who have not been on ARTs for at least 3 months from the beginning of this study.
3. Patients who do not give consent to be a part of the study.
4. Patients who were not in the clinic during our data collection

### Sample Size Determination

The minimum sample size (N) was determined using the Cochran's sample size formula.

$$N = Z^2 \frac{P(1-P)}{d^2}$$

N = minimum sample size

Z $\alpha$  = Confidence level is 95%, Z $\alpha$  = 1.96

P = prevalence of non-adherence from a previous study 75%<sup>27</sup> d = margin of error tolerated, usually 5% (or 0.05%) at 95% confidence limit

$$N = (1.96)^2 \times 0.0575_2 (1-0.75)$$

$$N = (1.96)^2 \times 0.0575_2 (1-0.75)$$

$$N = \frac{8416 \times 0.75 \times 0.25}{0.0025}$$

$$N = \frac{0.7203}{0.0025}$$

$$N = 288.12$$

An addition of 10% to make up for attrition will bring the sample size to;

$$10\% \text{ of } 288.12 = \frac{10 \times 288.12}{100} = \frac{2881.2}{100} = 28.812$$

$$\text{Sample size} = 288.12 + 28.812 = 316.932 \text{ Sample Size}$$

$$= 316.932.$$

A sample size of 320 will be used

### Sampling Technique

Systematic random sampling method was used to select respondents. UNTH HIV/AIDS clinic runs four times a week, Monday to Thursday. Every week, the clinic received an average of about 800 patients. A sampling interval of 5 was calculated by dividing the average number of patients that attend clinic per day (200) by the number of patients to be interviewed per day (40) over 10 clinic days. Every 5th patient upon arrival at clinic will be recruited for the study after balloting between the first ten patients to get the first respondent.

### Ethical Considerations

The approval for this study was sought and obtained from the Health Research and Ethics Committee of the hospital. The same has been attached in this study.

### Study Instruments

A semi-structured, interviewer-administered questionnaire was used for data collection. It consists of four sections. Section One: Sociodemographic data. Section Two: Knowledge of antiretroviral therapy. Section Three: attitude of patient's towards Anti-retroviral therapy.

Section Four: Adherence pattern of the respondents.

### Data Collection and Analysis

Data was collected by members of this research group. This questionnaire was pretested amongst 20 randomly selected patients in ESUTH Parklane to ensure that there were no ambiguous questions.

Statistical data analysis was done using the Statistical Package for Social Sciences (SPSS) software version 21 for Windows. Analysed data is represented in tables and appropriate graphs.

### Data handling

Seven (7) questions were asked to know the social demographics of the patients.

Eight (8) questions were asked to assess knowledge of participants about ART. From the responses obtained, an arbitrary scoring system will be used, where all favourable responses will be given a mark of 2, unfavourable responses will be given a score of 0, neutral or responses that showed uncertainty will be given a score of 1. Maximum obtainable score is 16. A total score <70% will be classified as poor knowledge, while a total score >70% will be classified as good knowledge.

Seven (7) questions were asked to assess attitude of participants towards ART using the Likert scale scoring system. A total score of <70% will be classified as negative attitude, while a total score of >70% will be classified as positive attitude.

Ten (10) questions were asked to assess adherence of participants to ART. From the responses obtained, an arbitrary scoring system will be used, where all favourable responses will be given a mark of 2, unfavourable responses will be given a score of 0, neutral or responses that showed uncertainty will be given a score of 1. Maximum obtainable score is 23. A total score <70% will be classified as poor knowledge, while a total score >70% will be classified as good knowledge.

### Limitations of the study

The study anticipated some limitations that might hinder access to information that the study sought.

The study is a very sensitive topic amongst people living with HIV and therefore there is a possibility that some patients were not outrightly honest with their responses. The findings of this study were therefore limited to the extent to which the respondents were willing to provide accurate, objective and reliable information.

Some of the respondents targeted in this study were reluctant to give out information fearing that the information being sought may be used to intimidate them or print a negative image about them. For patients already suffering from social stigma, participating in this study was a bit tasking as they felt it could worsen their social stigma.

However, we allayed their fears by letting them know that their names, hospital numbers or identities were of no essence. We also handled this by carrying a letter of approval from the Head of

Department, HIV Clinic PEPFAR, UNTH to assure them that all information was treated with confidentiality and will be used purely for academic purposes.

We also had the challenge of language barrier where some of the respondents were not very good with English language. We overcame this by helping them interpret the contents of the questionnaire.

Finally, the Monday sit-at home currently being observed in the South Eastern part of Nigeria, made data collection a bit difficult as we could not collect data from the Clinic on Mondays since they did not operate on such days and did not compensate it by working on Fridays. We had only Tuesday to Thursday to collect the minimum sample needed for this study.

## RESULT:

<b>FACTORS</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
<b>AGE</b>		
- [18-27]	24	7.5
- [28-37]	60	18.7
- [38-47]	115	35.8
- [48 and above]	122	38.0
<b>GENDER</b>		
- Male	85	26.5
- Female	236	73.5
<b>OCCUPATION</b>		
- Civil servant	66	20.6
- House wife	10	3.1
- Trader	49	15.3
- Farmer	44	13.7
- Business	123	38.3
- Unemployed	27	8.4
- Others	2	.6
<b>ETHNICITY</b>		
- Igbo	306	95.3
- Yoruba	2	.6
- Hausa	4	1.2
- Others	9	2.8
<b>MARITAL STATUS</b>		
- Single	41	14.3
- Married	224	69.8
- Divorced	5	1.6
- Separated	5	1.6
- Widowed	41	12.8
<b>RELIGION</b>		
- Christianity	317	98.8
- Islam	1	.3
- African traditional religion	1	.3
- None	2	.6

4.0 TABLE 1: Sociodemographic Status of the participants (N=321).

Table 1 shows that the modal age of the respondents was 48 and above while the mean age was 44.5 years, with most (73.5%) of them being female, married (69.8%), of Igbo origin (95.3%), Christians (98.8%), and earn a living through business (38.3%).

4.1 TABLE 2-3: Knowledge of Anti-retroviral therapy (ART) among the participants (N=321).

<b><u>FACTORS</u></b>	<b><u>FREQUENCY</u></b>	<b><u>PERCENTAGE</u></b>
<b>HOW DOES ARTS WORK</b>		
- Cures HIV	32	10.0
- Reduces HIV related illness	151	47.0
- Reduces HIV related deaths	33	10.3
- Slows progression of HIV	78	24.3
- I don't know	27	8.4
<b>CAN ART PREVENT MOTHER TO CHILD TRANSMISSION OF HIV (PMTCT)</b>		
- Yes	246	76.6
- No	35	10.9
- I don't know	40	12.5
<b>WHAT PERCENTAGE OF ART ADHERENCE IS REQUIRED?</b>		
- Less than 90%	25	7.8
- 95 to 100%	263	81.9
- Others	10	3.1
- No response	23	7.2
<b>CAN MISSING ART DOSE LEAD TO DISEASE PROGRESSION</b>		
- Yes	261	81.3
- No	30	9.3
- I don't know	30	9.3
<b>HOW OFTEN SHOULD YOU TAKE ART</b>		
- Daily	316	98.4
- Twice weekly	1	.3
- Monthly	1	.3
- yearly	1	.3
- Others	2	.6

**WHAT IS THE TOTAL DURATION OF ART TREATMENT**

- one month	6	1.9
- 6 months	25	7.8
- 1 year	5	1.6
- 2 years	3	.9
- 5 years	1	.3
- 10 years	2	.6
- Lifelong	248	77.3
- Others	25	7.8
- No response	6	1.9

**ARE YOU AWARE OF CD4 TEST?**

- Yes	249	77.6
- No	72	22.4

**ARE YOU AWARE OF VIRAL LOAD TEST**

- Yes	270	84.1
- No	51	15.9

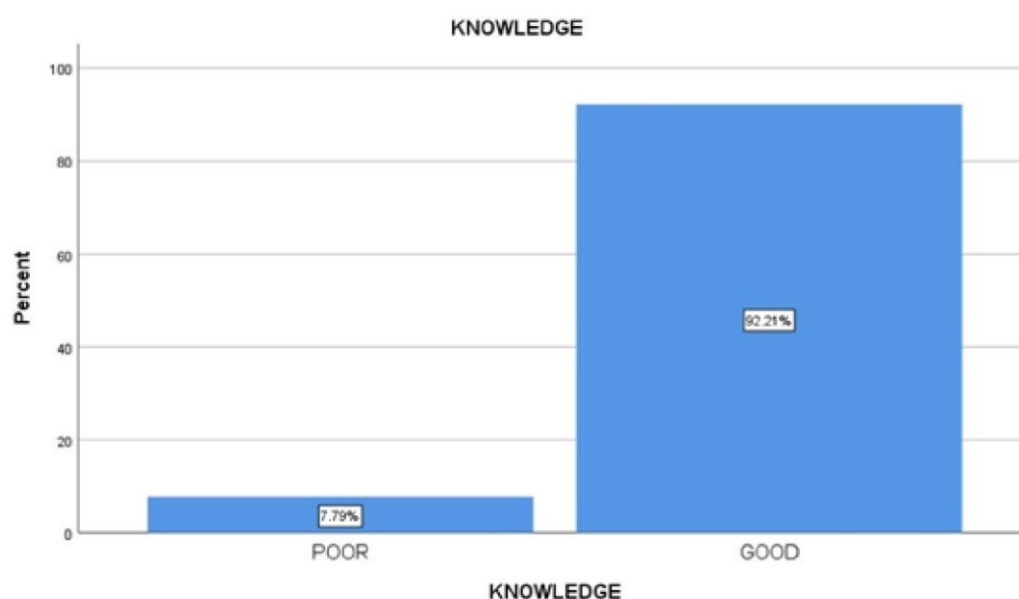
**Table 2** shows that most respondents (47.0%) believe that ART works by reducing HIV related illness, that ART can prevent mother to child transmission (76.6%), adherence meant 95 to 100% (81.9%), that missing ART dose can lead to progression of the disease (81.3%), that ART should be taken daily (98.4%), and that ART treatment is lifelong (77.3%). Majority of the respondents were aware of CD4 test (77.6%) and Viral Load test (84.1%).

**Table 3:**

Table 3 shows that there was overall good (92.2%) knowledge of anti-retroviral drug among the respondents.

	<b>KNOWLEDGE</b>	
	<b>FREQUENCY</b>	<b>PERCENT</b>
POOR	25	7.8
GOOD	296	92.2

FIGURE 1;

**.2 TABLE 4-5: Attitude of patients towards Anti-retroviral therapy (N=321).**

	Strongly Disagree (%)	Disagree (%)	Undecided (%)	Agree (%)	Strongly Agree (%)	Total (%)
<b>Are you convinced of the effectiveness of ART</b>	10 (3.1)	12 (3.7)	5 (1.6)	171 (53.3)	123 (38.3)	321 (100.0)
<b>Does ART have more benefits than harm?</b>	8 (2.5)	11 (3.4)	9 (2.8)	182 (56.7)	111 (34.6)	321 (100.0)
<b>Do you feel ashamed to take ARTs</b>	92 (28.7)	165 (51.4)	14 (4.4)	39 (12.1)	11 (3.4)	321(100.0)
<b>Do you believe that there are more effective methods to treat HIV than ART</b>	60 (18.7)	139 (43.3)	72 (22.4)	33 (10.3)	17 (5.3)	321 (100.0)
<b>ART side effects can lead to organ damage</b>	25 (7.8)	117 (36.4)	94 (29.3)	65 (20.2)	20 (6.2)	321 (100.0)
<b>My culture is against the use of ART</b>	102 (31.8)	185 (57.6)	16 (5.0)	9 (2.8)	9 (2.8)	321 (100.0)
<b>Do you need encouragement from family members to consistently take your drugs</b>	80 (24.9)	145 (45.2)	9 (2.8)	62 (19.3)	25 (7.8)	321 (100.0)

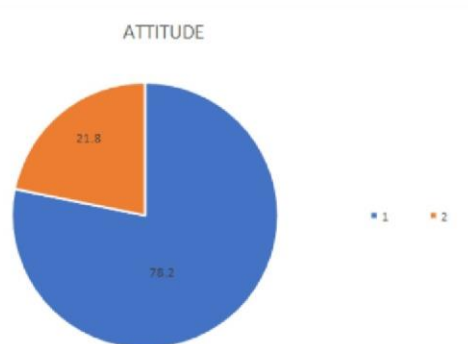
**Table 4** shows that most of the participants agreed to, being convinced of the effectiveness of ART (53.3%), ART having more benefits than harm (56.7%), however, majority disagreed to; feeling ashamed to take ART (51.4%), believing that there are more effective methods to treat HIV than ART (43.3%), ART side effects can lead to organ damage (36.4%), their culture being against the use of ART (57.6%), and that they need encouragement from family members to consistently take their drugs (45.2%).

**TABLE 5;**

Table 5 shows that there was an overall Positive (78.2%) attitude towards anti-retroviral drugs among the participants.

	ATTITUDE	
	FREQUENCY	PERCENT
POSITIVE	251	78.2%
NEGATIVE	70	21.8%

**FIGURE 2;**



**4.3 TABLE 6-7: Adherence pattern of respondents (N=321).**

<u>FACTORS</u>	<u>FREQUENCY</u>	<u>PERCENTAGE</u>
<b>HOW OFTEN DID YOU TAKE YOUR MEDICATION WITHIN THE PAST ONE MONTH?</b>		
- I did't take any	3	.9
- Once daily	314	97.8
- Twice a week	1	.3
- Others	3	.9
<b>WHEN WAS THE LAST TIME THAT YOU MISSED TAKING YOUR ANTI-RETROVIRAL PILLS</b>		
- Today	21	6.5
- Yesterday	10	3.1
- Earlier this week	11	3.4
- Last week	26	8.1
- Less than a months ago	32	10.0

- More than a month ago	39	12.1
- I have never missed	174	54.2
- Others	8	2.5

#### WHAT ARE THE REASONS FOR MISSING YOUR DOSES

- I developed side effects	8	2.5
- I forgot to take it	105	32.7
- Fear of stigma	1	.3
- Stock in health care was finished	2	.6
- Cost of transportation	8	2.5
- Pill burden	5	1.6
- Others	18	5.6
- No response	174	54.2

#### HOW DO YOU REMEMBER TO TAKE YOUR ARTS?

- Alarm	107	33.3
- Medication manager	13	4.0
- Family member	22	6.9
- Others	123	38.3
- None	56	17.4

#### HAVE YOU MISSED ANY CLINIC APPOINTMENT, IN THE LAST 3 MONTHS

- Yes	115	35.8
- No	206	64.2

#### IF YES, WHAT ARE YOUR REASONS?

- High cost of transportation	46	14.3
- Poor relationship with health workers	3	.9
- Inability to disclose HIV status	5	1.6
- Fear of stigmatization	5	1.6
- Others	56	17.4
- No response	206	64.2



**WHAT IS YOUR RELATIONSHIP WITH THE HEALTH WORKERS AT THE HIV CLINIC UNTH**

- Very bad	3	.9
- Bad	2	.6
- Good	137	42.7
- Very good	92	28.7
- Excellent	87	27.1

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**HOW LONG HAVE YOU BEEN ON THIS TREATMENT**

- three months	5	1.6
- six months	7	2.2
- one year	15	4.7
- two years	15	4.7
- Three years	52	16.2
- More than 3 years	227	70.7

**HAVE YOU DISCLOSED YOUR HIV STATUS TO ANYONE?**

- Yes	290	90.3
- No	31	9.7

**IF YES, WHO?**

-Father	32	10.0
-Mother	47	14.6
-Brother	30	9.3
-Sister	54	16.8
-Friend	11	3.4
-Fiancée	40	12.5
-Healthcare provider	15	4.7
-Classmate	2	.6
- Others	59	18.4
- No response	31	9.7

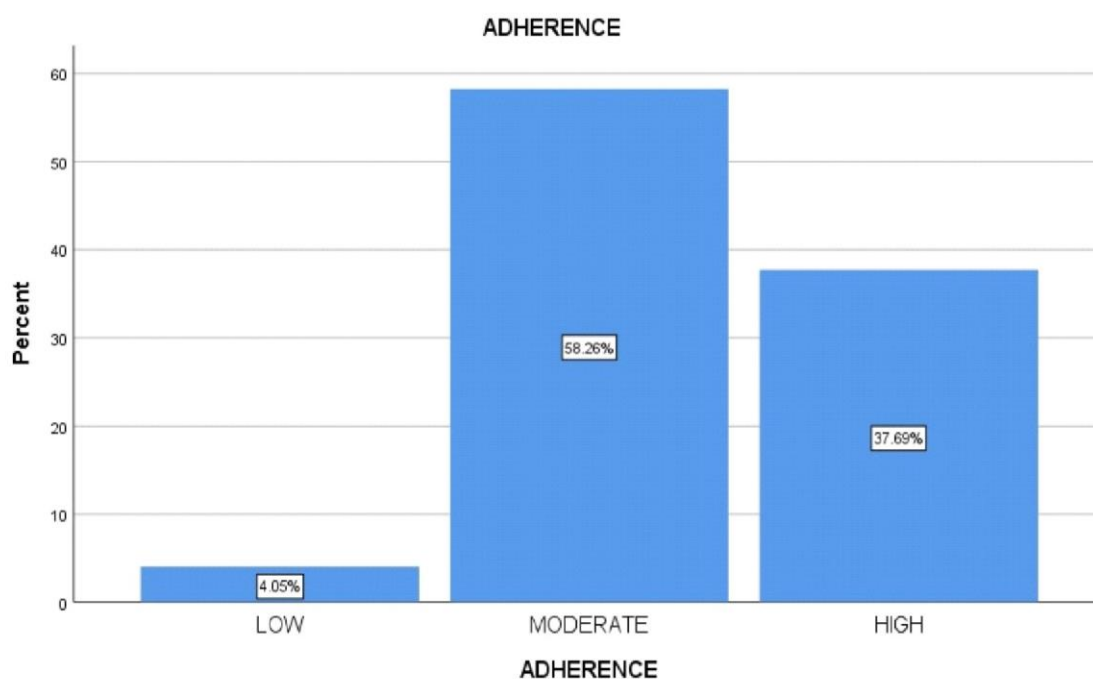
Table 6 shows that most (97.8%) participants take ART once daily, most have never missed their pill (54.2%), and was mostly because they forgot (32.7%). Majority (38.3%) use alarm as reminder to take their pills, and although most participants (64.2%) have never missed a clinic appointment in the past 3 months, however, those who have said it was mostly (14.3%) due to high cost of transportation. Majority of the respondents have good (42.7%) relation with their health care provider, have disclosed (90.3%) their HIV status to someone, when asked who, most said sister (16.8%), followed by mother (14.6%).

**TABLE 7;**

Table 7 shows there was a moderate to high (62.3%) adherence to ART among the participants.

	ADHERENCE	
	FREQUENCY	PERCENT
LOW	13	4.0
MODERATE	187	58.3
HIGH	121	37.7

**FIGURE 3;**



**4.4 TABLE 8: The relationship between level of knowledge of respondents and attitude towards ART, adherence to ART and socio-demographic factors (N=321).**

FACTORS	KNOWLEDGE OF ART (%)		CHI-SQUARE	P-VALUE
	POOR	GOOD		
<b>ATTITUDE</b>				
- NEGATIVE	6(24.0)	64(21.6)	0.08	0.78
- POSITIVE	19(76.0)	232(78.4)		

## ADHERENCE

- LOW	4(16.0)	9(3.0)	10.54	0.005
- MODERATE	11(44.0)	176(59.5)		
- HIGH	10(40.0)	111(37.5)		

## SEX

- MALE	5(20.0)	80(27.0)	0.59	0.44
- FEMALE	20(80.0)	216(73.0)		

## AGE

- [18-27]	7(28.0)	17(5.7)	17.72	0.001
- [28-37]	5(20.0)	55(18.6)		
- [38-47]	8(32.0)	107(36.1)		
- [48 AND ABOVE]	5(20.0)	117(39.5)		

Table 8 shows that there is no association between knowledge of ART and attitude towards ART ( $p=0.78$ ), as well as gender ( $p=0.44$ ). However, there was a significant association between knowledge and adherence to ART ( $p=0.005$ ), as well as with age of respondents ( $p=0.001$ ).

#### 4.5 TABLE 9: The relationship between level of adherence of respondents and attitude towards ART as well as socio-demographic factors (N=321).

FACTORS	ADHERENCE TO ART (%)			CHI-SQUARE	P-VALUE
	LOW	MODERATE	HIGH		
<b>ATTITUDE</b>					
- NEGATIVE	3(23.1.)	4(21.9)	26(21.5)	0.02	0.89
- POSITIVE	10(76.9)	146(78.1)	95(78.5)		
<b>SEX</b>					
- MALE	2(5.4)	50(26.7)	33(27.3)	0.87	0.65
- FEMALE	11(84.6)	137(73.3)	88(72.7)		

**WHAT IS YOUR  
RELATIONSHIP WITH  
THE  
HEALTH WORKERS AT  
THE HIV CLINIC UNTH**

- VERY BAD	2(15.4)	1(0.5)	0(0.0)	84.66	0.000
- BAD	0(0.0)	2(1.1)	0(0.0)		
- GOOD	7(53.8)	96(51.3)	34(28.1)		
- VERY GOOD	3(23.1)	63(33.7)	26(21.5)		
- EXCELLENT	1(7.7)	25(13.4)	61(50.4)		

**HAVE YOU DISCLOSED  
YOUR HIV STATUS TO  
ANYONE?**

- YES	6(46.2)	166(88.8)	118(97.5)	36.77	0.000
- NO	7(53.8)	21(11.2)	3(2.5)		

Table 9 shows that there is no association between adherence to ART and attitude towards ART ( $p=0.99$ ), as well as gender ( $p=0.65$ ), however, there was a significant association between adherence to ART and age ( $p=0.000$ ).

**4.6 TABLE 10: The relationship between attitude of respondents and sociodemographic factors (N=321).**

**ATTITUDE TOWARDS ART (%)**

FACTORS	POOR	GOOD	CHI-SQUARE	P-VALUE
<b>SEX</b>				
- MALE	19(27.1)	66(26.3)	0.02	0.89
- FEMALE	51(72.9)	185(73.7)		
<b>AGE</b>				
- [18-27]	12(17.1)	12(4.8)	17.14	0.001
- [28-37]	15(21.4)	45(17.9)		
- [38-47]	27(38.9)	88(35.1)		
- [48 AND ABOVE]	16(22.9)	106(42.2)		

Table 10 shows that there was no significant association between attitude of respondent towards ART and gender ( $p=0.89$ ). However, there was with age ( $p=0.001$ ).

## DISCUSSION

### Introduction

With existing significant variation in knowledge of ART, attitude towards ART and adherence to ART among patients living with HIV/AIDS, it becomes imperative for adequate data to be collected and document, so as to guide future intervention and strategies towards a more effective method of managing HIV/AIDS cases, while in turn controlling its spread and dead count. This present study was done to assess and understand the level of knowledge of ART, attitude towards ART, adherence to ART and factors affecting adherence to ART among persons under going ART treatment in HIV clinic, University of Nigeria Teaching Hospital, Enugu state.

The socio-demographic characteristics of respondents in this study revealed similar proportions of Married respondents compared with the National demographic data. However, there was an almost equal proportion of Christians and Muslims in the national Survey whereas there were majorly Christians in this study with a few African traditional worshippers. Also, a higher Proportion of respondents in this study had Secondary and Tertiary education compared to the National Survey<sup>63</sup>.

In this Study, the average age of respondents was 44.5 years and the male to female sex ratio was 0.4. Furthermore, it was observed during data collection that women were usually more than men in every clinic appointment. This was because some of these men had a poor health seeking behavior while some others simply had persons/spouse who came to collect the drugs for them. A study conducted in another African country among adult HIV patients in clinic settings also had higher proportions of female respondents and similar average ages<sup>64</sup>.

Poor Knowledge of ART has always been a barrier to Adherence amongst People living with

HIV<sup>64</sup>. In this study, most of the respondents had good knowledge about ART. Previous studies conducted in Africa have also shown good knowledge about ART<sup>65,66</sup>. This could be as a result of the quality education and counseling on the therapy, its benefits and the need for good adherence given by Health-care providers in the clinic to the respondents<sup>67</sup>.

There is an overall good knowledge about ARTs amongst respondents in this study (92.2%) when compared to a previous study obtained in Uganda (78.2%). Also, majority of respondents are aware of CD4 and Viral Load testing. This good knowledge reflected in our study implies that they are more likely to take ART correctly.

From our study, we noted that specific knowledge areas still needed health education intervention; For instance, the proportion of respondents who knew that ARTs could prevent disease progression (24.3%) and transmission from mother to child (76.6%) were low when compared to a study conducted in South

Africa, where 98% and 90% of respondents knew that ARTs could prevent disease progression and Vertical transmission respectively.

The reported non-adherence level in this study was lower than that recorded in another study conducted in South-western Nigeria by Olowookere<sup>26</sup>. This could be because these respondents had a good knowledge of Anti-Retroviral Therapies and knew that they needed to attain about 95 to 100 perfect ART adherence levels if they wanted to live a normal life.

However, in places like Makurdi<sup>29</sup>, Nnewi<sup>30</sup> and Abakaliki<sup>31</sup>, non-adherence level was 27.1%, 21.7% and 10.8%, which are much lower than the result gotten from our study. Result of nonadherence in North-America of 45% was slightly lower than our result. Our findings were also higher than the average non-adherence rate among African patients of 22.7% in a meta-analysis<sup>25</sup>.

There is no gold standard for measuring adherence, and our measurement of adherence is only based on patients' report on missed doses; this may be subjected to social desirability and recall bias, and literature showed that patients tend to overestimate adherence<sup>32</sup>.

The major identified reasons for non-adherence in this study were forgetfulness and cost of transportation. Similar reasons were reported in studies conducted in Adama and Jimma hospitals<sup>68</sup> and Yirgalem Hospital<sup>69</sup>, Ethiopia, and in Kenya<sup>39</sup>. Our findings, however, contradicted with another study result by Olowookere<sup>26</sup>

Minority (1.6%) of the participants blamed failure of adherence on pills burden which contradicts results obtained from a study early conducted in Jos, Nigeria<sup>36</sup>.

Based on keeping clinic appointments, about 35.8% of the respondents had missed a clinic appointment in the last 3 months. This was attributed majorly to the high cost of transportation needed to get to the HIV clinic center from their various locations. This is in total agreement with studies conducted in Ilorin, Nigeria<sup>36</sup> and Uganda<sup>70</sup>.

Those who have disclosed (90.3%) their HIV status to someone showed to have better (>90%) adherence than those who hadn't. This agrees with results from two different international studies; one done in Tanzania<sup>22</sup> and the other in China<sup>38</sup>. Participants with good to excellent relationship with the health workers at the treatment center showed better (>90%) adherence to ART treatment that those who have very bad to bad relationship. This was not out of place as several previous studies showed similar result<sup>49</sup>.

In this study, most of the respondents had a positive attitude towards ART in this study. A finding in a similar study conducted in Lagos<sup>37</sup> also showed a positive attitude amongst HIV patients on ARTs. HIV control programs in Nigeria (including Enugu

metropolis) have as years gone by, succeeded in increasing awareness about HIV not being a death sentence because of the use of ARTs. Most of the participants 53.3% agreed to, being convinced of the effectiveness of ART.

56.7% believed that ART had more benefits than harm. This was against a study conducted in China where more 40% felt that ART could be harmful to their body<sup>71</sup>. However, majority disagreed to, feeling ashamed to take ARTs 51.4% while 10.3% believed that there are more effective methods to treat HIV than ART. This was a similar finding in a study conducted by Raberahona et al<sup>55</sup> in Madagascar.

20.2% believe that ART side effects can lead to organ damage as against 28.3% that was shown in a study conducted in Lagos<sup>37</sup>. 57.6% disagreed that their culture is against the use of ART, and 45.2% disagreed that they need encouragement from family members to consistently take their drugs.

### Conclusion

Although this study documented good knowledge and positive attitude towards ART, adherence remains sub-optimal. Higher education was associated with good knowledge while older age was associated with good adherence.

ART treatment is a lifelong management process; patient adherence to clinic visits and therapy has been considered major factors in determining the prognosis. This study revealed that most patients on ART find it difficult to keep up with clinic visits due to cost of transportation while some did not adhere to their medications because they simply forgot to do so. It also found out the men had a poor health seeking behavior. Better outcomes had a direct relationship with patient-clinician relationship, hence, patients with poor visit routine are most likely to come down with poor prognosis.

### Recommendation

Awareness needs to be created on the need for disclosure of one's status to a caregiver or close person capable of ensuring effective adherence to ART. A targeted health education and awareness should also be instituted for men, this is because it was observed that men had a poor health seeking behavior. There's a need for them to come to the hospital as and at when due.

Make-shift ART treatment centers can be provided to reduce transportation cost for financially handicapped patients.

There is a need for health workers to keep emphasizing on 95 to 100% adherence, the need for patients to keep to their appointment, the need for alarm reminders, medication reminder and the use of memory aids to help reduce forgetfulness. There is also an urgent need to keep emphasizing the benefits of adherence and consequences of non-adherence during counselling, in order to improve the adherence rate among the study population.

A further study needs to be done to understand how family and social support plays a role in adherence to therapy.

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## Comparative Assessment Of Sanitary Conditions Of Students' Hostels At Enugu Campus And Ituku-ozalla Campus Of UNN.

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### A B S T R A C T

**BACKGROUND:** Sanitation is the promotion of hygiene and prevention of disease through the provision and access to safe water and adequate sanitation facilities; and good individual hygiene practices. Sanitation is one of the greatest problems facing developing countries due to inadequate facilities, poor funding, and poor implementation of policies as well as wrong lifestyle<sup>1</sup>. Nigeria as a developing country, little is known about the sanitary condition of students' hostel in her higher institutions of learning. This study is aimed the comparative assessment of sanitary conditions of student's hostel at Enugu campus and ItukuOzalla campus of UNN.

**METHODS:** We conducted a cross sectional survey involving 500 students from 4 hostels in UNN (NUGA, IMOKE, GH, and LADY IBIAM) using cluster sampling technique. Information on sociodemographic characteristics, students' awareness of hostel sanitation, perceived hygienic condition of hostel toilet and reported sanitary condition of student hostel and toilet was obtained using an adapted, structured self-administered questionnaire. Frequencies and proportions were computed as descriptive statistics. Data was analyzed using SPSS version.

**RESULTS:** NUGA hostel had more rooms (200) than the other three hostels, while GH hostel had the least numbers of rooms (100). Number of persons to a room in NUGA hostel is 2 at most, while the rest of the hostels ranges from 4 – 5 persons in a room. All the hostels had problem with water availability. Their major source of water is well and tank water. As regard their sewage disposal, 50% of the septic tank pipe is broken and the area smells in GH and LADY IBIAM. 3 out of the 4 hostels reported that they noticed no difference between the medical Hostels and the non-medical hostels in UNEC except for the IBIAM hostel with 75 out of 125(60.0%) respondents of the said hostel reporting that there is a difference.

**CONCLUSION:** The sanitary conditions of students' hostel at the Enugu campus and ItukuOzallacampus of UNN is poor for hostels in ENUGU campus (GH, LADY IBIAM, IMOKE) but average for ItukuOzalla campus. The main reason identified for this observation are: overcrowding in the hostels (high room occupancy rate), few toilet facilities for many students and inadequate water supply for sanitation.

**KEYWORDS:** Sanitation, hostel, toilets, hygiene and water.

### BACKGROUND OF THE STUDY

Sanitation is the promotion of hygiene and prevention of disease through the provision and access to safe water and adequate sanitation facilities; and good individual hygiene practices. Traditionally, sanitation refers to the provision of facilities and services for the safe disposal of human urine and feces<sup>1</sup>. It is also explained as the hygiene means of promoting health through prevention of human contact with hazard of wastes. It involves the maintenance of hygienic conditions, through services such as garbage collection and waste disposal. Sanitation is vital to health and it generates economic benefits and contributes to dignity and social development of any nation.

According to the United Nations, sanitation is vital to health; it

generates economic benefits and contributes to dignity and social development<sup>2</sup>. There is high morbidity and mortality related to poor sanitation, lack of water and poor hygiene globally, with the developing countries bearing the greatest load. Sanitation related diseases debilitate and kill one million Africans every year. The number of people without improved sanitation facilities globally stands at 2.6 billion, and of these 533million is in sub-Sahara Africa<sup>3</sup>. In regard to school sanitation, it is a kind of sanitation that is practiced in the school to promote hygiene and prevent disease among school children through the provision of and access to safe water and adequate sanitation facilities. If poorly practiced, it can highly affect the health, academic performance and retention rates of pupils. Studies indicate that an estimated 400 million children have diminished learning abilities due to intestinal worm infestation<sup>4</sup>; while according to the International Resource Centre on Water and Sanitation, 75% of adolescent girls in marginalized

areas drop out of school due to the lack of adequate private sanitation facilities in school<sup>5</sup>. Some of such sanitary facilities like pit latrines are utilized as an effective and convenient method of on-site human waste disposal in areas not served by a sewerage system. They also serve to encourage prevention of disease, better sanitation practices and to deter open defecation. It is estimated that globally four thousand children less than five years die daily from diarrheal diseases alone, and millions of others are made sick, weakened or disabled by diarrhea and other water-and sanitation-related diseases<sup>6</sup>. Studies indicated that 2.6 billion people (approximately 39% of the global population), lack access to improved facilities for the disposal of human excreta, such as a basic pit latrine, toilet connected to a septic tank or sewer system or a composting toilet<sup>6</sup>. In several parts of the developing world, sanitation lags behind in all infrastructure development. In sub Saharan Africa, 66% of the population had no access to basic sanitation services in 2008<sup>6</sup>.

### STATEMENT OF PROBLEM

Sanitation is one of the greatest problems facing developing countries due to inadequate facilities, poor funding, and poor implementation of policies as well as wrong lifestyle<sup>1</sup>.

One of the identifiable factors affecting Enugu is water supply. The availability of adequate water supply both in quality and quantity is essential for human existence<sup>7</sup>. The supply of potable water to the majority of the population in Enugu Urban especially in the urban areas is very much inadequate. Today, only about 30% of our population have access to potable water supply. Even those privileged places that have access to such facility are not being served efficiently<sup>8</sup>.

From a preliminary enquiry, most residents in Enugu have almost come to the point of taking water scarcity as a norm. The quantity of portable water supplied in Enugu urban by Enugu State Water Corporation does not really meet the demand of the populace. Some parts of the town have had dry taps for so many years. The few areas supplied with portable water usually have water shortages. As a result, water for domestic and industrial purposes is obtained from alternative sources.

The problem of water scarcity in Enugu urban is a major developmental concern because it threatens the sustainability of their social and economic development. The design of water distribution systems in general has been based on the assumption of continuous supply. However, in Enugu urban, the water supply system is not continuous but intermittent, leading to severe supply pressure losses and great inequities in the distribution of water<sup>9</sup>.

The study is, therefore, aimed at identifying the sanitary conditions of student's hostels in UNEC and ItukuOzalla campus of UNN.

### RESEARCH QUESTIONS

1. What is the sanitation status of students' hostels in UNEC and ItukuOzalla campus?
2. Is there a difference between sanitary conditions of medical student's hostels and nonmedical student hostels in UNEC?
3. What is the perception and practice of medical students in UNEC, IMOKE and NUGA on personal hygiene and sanitation in the hostel?

### JUSTIFICATION

The study will ascertain the dominant factors influencing water supply system student hostel accommodation and environmental sanitation. The understanding of these factors will help in improving the sanitary condition of UNN Hostels in Enugu. The school authorities will benefit from the study, which will highlight the appropriate measures to ensure steady supply of good quality water to the students. Further, the project will be useful to interested and independent body of researchers who wish to conduct research in similar fields.

### GENERAL OBJECTIVES

This study is aimed to assess sanitary conditions of student's hostel at Enugu campus and ItukuOzalla campus of UNN

### SPECIFIC OBJECTIVES

1. Availability of Sanitation/hostel facilities and water supply
2. Cleanliness of the hostel, bathroom and toilet facilities
3. To verify the working conditions of toilet and bathroom facilities in Enugu campus and ItukuOzalla campus of UNN
4. To collate feedback on challenges students, face while accessing the toilet and bathroom facilities in Enugu campus and ItukuOzalla campus of UNN

### LITERATURE REVIEW

#### HOSTEL ACCOMODATION

In Nigeria, the condition of students "housing in tertiary institutions has generated a great deal of concerns on the part of government and administrators of higher institutions. The problems become more pronounced and disturbing when the number of tertiary institutions and students "enrolment started increasing without a corresponding increase in the number of available accommodations to house them<sup>10</sup>.

University hostels are student housing which are known for providing appropriate environment in which to sleep, study as well as opportunity for social and informal academic interchange<sup>11</sup>.

The aim of university hostels is to provide students with the necessary amenities to develop an integrated personality besides providing a calm and peaceful atmosphere for students.

One of the key features students and their parents are concerned about when enrolling in a university is the availability of student hostel<sup>12</sup>. Student hostels form part of facilities that students take into consideration before making a choice of the school they intend to attend among other considerations<sup>13</sup>. Facilities in the student hostels include bedrooms which can serve the dual purpose of studying and sleeping, bathrooms and toilets, kitchen, laundry, recreational areas and access to internet services as this further enhances the learning experience.

Inadequate maintenance of facilities of hostel accommodation for students is very common in Nigerian universities. According to Ajayi *et al.* (2015), student hostels in Nigeria have not received the desired attention from the government and management of institutions; there have been reported cases of students taking ill in hostels as a result of poor sanitary conditions<sup>12</sup>. The number of students seeking and getting admission into universities increases every year<sup>14</sup>. This has led to the failure of the original design of university hostels. The design of student hostels should provide a sense of good architecture which would have a lasting impression on the minds of students<sup>14</sup>. It is crucial to note that student hostels must not only be adequately provided in relation to the student population in the universities but they must also be able to satisfy their needs if the best is to be appropriated from them. Thus, it became important that student hostels are well designed and built with standard, improved and well-maintained facilities.

Since the 1970s, hostel accommodation in Nigerian universities has become worrisome due to unprecedented students' enrolment. These situations have caused crisis and disruption of academic calendar, with its attendant consequences. There is therefore the need to assess the availability, accessibility, and adequacy of the state of these facilities. While the increase in population of students has been growing in geometric proportion, the provision of befitting hostel accommodation and adequate facilities has been growing in arithmetic progression. This has also led to the emergence of a set of students known as "Squatters" in the hostels, while the officially allocated bed spaces are referred to as "Bed Lords". However, observations have shown that students' complaints in the past arose from inadequate welfare services particularly on issues bothering on hostel accommodation conditions and their maintenance; which has equally resulted into protests emanating from anxieties stirred by the combined effect of population explosion in the hostels and deteriorating facilities<sup>15</sup>. Research findings have shown that befitting accommodation facilities are central for conducive learning. Some of these include bed and beddings, electrical fittings and regular electricity supplies, functional plumbing materials, reading tables, chairs, window with mosquito nets, functional toilet facilities, good reading room,

security coverage, cleaning services and internet facilities. Moreover, living in university accommodation has been said to afford the students the opportunity to learn how to be less dependent on family members<sup>16</sup>.

In addition, it has been observed that it is easier for students to mingle and have close bonds with fellow students. All these aids functional living in the community. The attendant effects of incessant school closures and disruption of academic calendar are poor self-esteems by the students residing in those hostels, who are equally exposed to health and environmental hazards<sup>15</sup>. Thus, these make it pertinent to empirically examine the situation of hostel accommodations in University of Nigeria Enugu Campus and ItukuOzalla Campus, a Nigerian university.

From the review, tertiary institutions in Nigeria are seriously overcrowded. The fundamental cause of this issue is the expanding number of students being admitted, without a comparing increment in the quantity of hostel facilities<sup>17</sup>. A study done in federal university of Dutse in Nigeria review that the number of actual students allocated to a room is 4 but due to increasing population of university students entering the school, each room now contains 6 persons which is similar to other federal universities across Nigeria<sup>18</sup>.

## WATER SUPPLY

The availability of adequate water supply both in quality and quantity is essential for human existence. With the exponential increase in population, access to improved water remains an important pre-condition for sustaining human life, maintaining eco systems and for achieving sustainable development<sup>19</sup>.

From the field work conducted in University of Nigeria (UNN) Nsukka campus, it was found out that the university water works lacks adequate data record keeping to actually determine fluctuations in the quantity of water demanded and supplied in order to determine when to pump more or less. Also, the problems hindering improved water supply in the campus has been identified and analyzed and strategies for improved water supply discussed. From observations it can be seen that UNN campus water supply system is capable of satisfying the water requirements of the university community. However, due to mismanagement and nonfunctioning boreholes and leaking pipes, the reverse is the case. The average individual daily water need is 120 L/day. In the university total maximum estimation of about 2,500,000 L will be efficient for the university total water requirements. The 5 boreholes working for an average of 12 h each produces an average of about 1,620,000 L/day. It can therefore be deduced that the demand is greater than the supply. To improve the current supply using the current facilities in the university then; let's say the 9 existing boreholes are made to work effectively for at least an average of 12 h/day and produces at least 27,000 L/h<sup>20</sup>.

Another work done in Enugu metropolis to ascertain the

challenge of water availability shows the following:

1. About 61.7% of respondents agreed that there are significant challenges to regular supply of pipe-borne water in Enugu metropolis. The challenges to regular supply pipe-borne water in Enugu metropolis are consumer unwillingness to pay water rates, operational constraints, inadequate funding, increasing population, political interference, irregular payment of salary of Water Corporation, corrupt practice among staff of the Corporation, among others.
2. About 74.92% of respondents agreed that challenges to regular supply of pipe-borne water in Enugu metropolis have significant effects on staff performance. These challenges were in areas low revenue returns, lack of motivation, encouragement of corruption, loss of professionals, rusting of pipes, and low labour productivity.
3. About 57.6% of respondents agreed that ENSWC was taking no measures against the challenges to regular supply of pipe-borne water in Enugu metropolis. Measures against these challenges, such as orientation programme for new employees, training or on-the-job training for workers, regular payment of staff salaries, maintenance culture for infrastructure, prudent management of fund, sanction for erring employees or defaulters, and reward for performers were not taken<sup>21</sup>

A work done in Afe Babalola University Ado Ekiti (ABUAD) Ekiti State, reviews that the water supply routine in the University is commendable. The routines, which are source, treatment, storage and distribution, are the same as regards any place on earth that deals with water supply. The underground water source is not a viable option for this region because of its rocky terrain and because of that it has resulted in a scarcity of water for its populace. Water treatment is done so as to disinfect water pollutants. Chlorination is done so as to prevent contamination of water from pipeline or pipe network hence making the water safe and pure until final consumption<sup>22</sup>.

### CLEANINGNESS OF HOSTEL FACILITIES

Student's health has been a major contributing factor to their academic performances over the years because it determines the student's ability to read and prepare for his examinations; it even defines the ability of the student to write very well inside the hall which are primary aim of a student going to school. Health defined by WHO is the level of functional and metabolic efficiency of a

living organism. In humans it is the ability of individuals or communities to adapt and self-manage when facing physical, mental or social changes.

It is a widely accepted fact that students are known for their laziness and ego, many of them tend to leave their area of residence without taking care of it only to be waiting for cleaners to clean it for them but even as that the hostels are always very dirty because things are not done appropriately for example a student urinating in the front of the hostel where it shouldn't be is indirectly calling for mosquitoes to breed around the hostel according to a study done in University of Calabar<sup>23</sup>.

Waste generation is a major cause of dirtiness in the hostel due to the large number of students and if not properly manage may cause a lot of harm than good, wastes are generated on daily basis through different activities of human being and if not disposed of properly the way it should, they lead to pollution of the environment having serious implications on the health of the students residing in the hostel.

Different institutional bodies have been set up at different levels for environmental sanitation and tertiary institution like the University of Calabar is of no difference so as to ensure that students waste is properly disposed in a quest for the students residing in the hostel to be in good health. In a study carried out by Ogeah and Ikelegbe (2007) reveals that students are nonchalant about the cleanliness of their hostels and their environment generally<sup>24</sup>.

Even though the University system has hired cleaners to clean the hostels these cleaners are poorly supervised and with them not doing their jobs properly the hostel surrounding becomes a breeding site for all sorts of dangerous insects and pests such as mosquito which can expose the students to malaria, tsetse fly which when a student is bitten by will cause sleeping sickness and some many more insect with different health complications, even some students go as far as urinating and defecating indiscriminately outside the hostels because they cannot clean the dirty toilets themselves and in the long run they will still come to those polluted areas to carry out their daily activities like cooking, washing of clothes etc.

In school hostels; where one of the major problems is overcrowding and this has gone a long way to affect students' health. More than 200 students share four (4) toilets. Mostly girls in hostel have inadequate sanitation facilities. Inadequate sanitation in school hostel has jeopardized student's health; girls in the hostel are even affected more in this situation. From the foregoing, it is of utmost importance to find out the effect of hostel sanitation practices arising as a result of the scenario on student's health<sup>25</sup>.

### WORKING CONDITIONS OF HOSTEL FACILITIES

According to the National Universities Commission

(NUC) 2003, the numbers of students who seek admission into Nigeria Universities are tremendously increasing on a yearly basis with no corresponding improvement in the hostel's facilities to accommodate the teeming population of students. One of the key features students and their parents are concerned about when enrolling in a university is the availability of student hostel<sup>23</sup>

Facilities in the student hostels include bedrooms which can serve the dual purpose of studying and sleeping, bathrooms and toilets, kitchen, laundry, recreational areas and access to internet services as this further enhances the learning experience<sup>24</sup>. Inadequate maintenance of facilities of hostel accommodation for students is very common in Nigerian universities which is the most common reason while most Nigeria university hostel are in shamble except the ones owned by private institution.

According to Odauda et.al (2019) It is crucial to note that student hostels must not only be adequately provided in relation to the student population in the universities but they must also be able to satisfy their needs if the best is to be appropriated from them. Thus, it became important that student hostels are well designed and built with standard, improved and wellmaintained facilities.

#### **EFFECT OF INADEQUATE HOSTEL SANITARY CONDITION ON STUDENTS' HEALTH AND ACADEMIC PERFORMANCE**

Studies indicate that an estimated 400 million children have diminished learning abilities due to intestinal worm infestation<sup>25</sup>. while according to the International Resource Centre on Water and Sanitation, 75% of adolescent girls in marginalized areas drop out of school due to the lack of adequate private sanitation facilities in school<sup>26</sup>. Some of such sanitary facilities like pit latrines are utilized as an effective and convenient method of on-site human waste disposal in areas not served by a sewerage system<sup>27</sup>. They also serve to encourage prevention of disease, better sanitation practices and to deter open defecation. It is estimated that globally four thousand children less than five years die daily from diarrheal diseases alone, and millions of others are made sick, weakened or disabled by diarrhea and other water-and sanitation-related diseases<sup>28</sup>.

#### **RECOMMENDATION:**

The study will help the school administration to be aware of the challenges associated with hostel sanitation.

#### **RESEARCH METHODOLOGY**

##### **Study Area:**

Study will be carried out in Enugu state. Enugu state was created in 1991 by then military Head of State, General Ibrahim Babangida. Enugu city is located 223 meters above sea level and is surrounded by numerous hills and valleys. It is known for its resource of coal, hence the state slogan "Coal city".

It is located at latitude 6°30 'N and longitude 7°30 'E. the state lies within the semi tropical town forest belt in South Eastern Nigeria.

Enugu State is located in the south east geopolitical zone of Nigeria. It shares boundary with Anambra on the West, Abia State on the South, Kogi on the North, and Benue and Ebonyi on the East. Enugu was the headquarters of the former East Central State and Eastern Nigeria.

There are seventeen local government areas (LGAs) in the state with a total population of 3,267,837 (5,590,513 - 2006 estimate) people. The State has three urban centers: Enugu, Nsukka and Oji River. The state capital is a modern city which covers an area of 85 sq. km with a population of about 717,291 people. It has well developed coal mining, commercial, financial and industrial center, with booming economy and vast investment opportunities. The state is predominantly agrarian with yam tubers, palm produce and rice being their main produce. predominant religion is Christianity and predominant tribe is Igbo.

There are several tertiary institutions in Enugu State, and these serve to award certificates, diplomas, and academic degrees: Universities, Colleges of Education and Polytechnics, Business Schools, and Institutes.

The University of Nigeria has four campuses: Nsukka (University of Nigeria, Nsukka-871 hectares), Enugu (University of Nigeria Enugu campus-200 hectares), ItukuOzalla (University of Nigeria teaching hospital- 500 hectares) and Aba (University of Nigeria, Aba campus). The first three are located in Enugu state while the last at Abia state. The faculties of agriculture, arts, biological sciences, education, engineering, pharmaceutical sciences, physical sciences, social sciences and veterinary medicine are located at Nsukka campus.

University of Nigeria Enugu Campus (UNEC) was previously known as the College of Arts, Science and Technology. It was incorporated into the university in 1961 and consists of 200 hectares of land in the heart of the Enugu city. The campus is located in Enugu and houses six faculties. These are the faculties of health sciences, law, business administration and environmental studies. The Enugu campus also has 9 student hostels which include the 8 undergraduate hostels

(6 female and 2 male) and 1 post graduate hostel. The undergraduate hostels are the JeretonMarriere Hostel, Samuel Manuwa Hall, Adelabu Hall, Odumegwu Ojukwu Hall, Presidential Hall and Lady EudorahIbiam hostel for the females and Mbonu Ojike hostel and Kenneh Dike hostel for the males. The post graduate hostel is the Kwame Nkurumah hostel.

The ItukuOzalla campus has the faculty of medical sciences and dentistry. It has one undergraduate hostel which is the NUGAhostel.

### Study Population

This study will be conducted among the undergraduate students who reside in the undergraduate student hostels in Enugu Campus UNEC and ItukuOzalla Campus UNTH.

### Inclusion Criteria

All undergraduate students who reside in the undergraduate student hostels in Enugu Campus UNEC and ItukuOzalla Campus UNTH.

### Exclusion Criteria

- Illegal occupants or residents of the undergraduate hostels based on registration at the student affairs department.
- 100 level students of the university who reside in the hostels
- Students in 200 to 600 level who have stayed in the hostel for less than 3 months.
- Students who spend most of their time away from their hostel.
- Students who are too ill or unwilling to participate in this study.
- Those that were not present at the time of data collection.

### Study Design

This study design is a descriptive cross-sectional study that will be carried out among the undergraduate students who reside in the undergraduate student hostels in Enugu Campus UNEC and ItukuOzalla Campus UNTH.

### Sample Size Determination

All students studied were duly informed and equally directed not to fill more than one questionnaire to avoid double recruitment.

The sample size was estimated using results from a study by Anamali C.P. et al (2019) on Assessment of the Sanitation Status in a Tertiary Institution in Southeastern Nigeria. The study demonstrated that the percentage of students who were not satisfied with the sanitary conditions or felt that it was inadequate was 92.9%.

The sample size for this study will be determined using the Cochran formula, assuming a confidence limit of 95% and a 5% margin of error.

$$n = Z^2 \times P(1-P) / d^2$$

The minimum sample size is calculated as thus

$$n = \frac{Z^2 \times P(1 - P)}{d^2}$$

Z represents confidence level which is 95%=1.96

P represents percentage of women that are awareness of the screening methods = 92.9%

d represents margin of error tolerated which is 5% = 0.05

$$n = \frac{96^2 \times 0.929(1 - 0.929)}{0.05^2} \cdot 1$$

$$n = 0.2533880944 / 0.0025$$

$$n = 101.0355$$

An addition of 10% to make up for attrition will bring the sample size to

$$10\% \text{ of } 101.0355 = 10/100 \times 101.0355 = 10.1036$$

$$\text{Sample size} = 101.0355 + 10.1036 = 111.1391$$

The minimum sample size would approximate to 111.

### Sampling Technique

A cluster sampling method will be used for sample collection. This method will be used to select the hostels to be studied and will also be used to determine the students to be studied until the calculated sample size is achieved to get a representative data and help compare our findings between the selected hostels. The total number of samples was divided equally between the various hostels and individuals were chosen at random until the required number was obtained.

### Study Tool

A pre-tested self-administered structured questionnaire will be used to collect data from the respondents. Data was collected at the hostels. Also, an observation checklist will be used by the researcher to standardize the data collected.

### Data Collection

The self-administered questionnaire will be pre-tested among students from the faculty of medical sciences, UNEC, who are not selected for the study. This is to ensure that there are no ambiguous questions and modifications can also be done accordingly to suit the objectives of the study. Informed consent will be sought and obtained before the data collection. The data collection will be done by members of the research group proper.

### Data Analysis

Data analysis will be done using Statistical Package for the Social Sciences (SPSS), and presented using tables, bar-charts, and pie-charts.

### Ethical Consideration

The proposal will be submitted to the Health Research and Ethics



Review committee, University of Nigeria Teaching Hospital (UNTH), Ituku-Ozalla, Enugu State for ethical clearance.

During the data collection, informed consent will be obtained from the respondents in written form and the respondents will be told what the research is all about and confidentiality will be maintained. Also, respondents would be duly made to understand that they are free to pull out at any point during the study without any consequences. Participants will be assured of anonymity during and after the study. There will be non-disclosure of personal information and respect of privacy.

#### RISKS AND BENEFITS

**Risks:** In the course of the study, the participants may not be satisfied with the way their opinions are being sought. They also may not have the required information needed from them. Participants will not be coerced, deceived or compensated in cash other than courtesy.

**Benefits:** Upon analysis, this study will help the institution to know the sanitation conditions and lack of facilities, incorporating ways of solving them to make the conditions conducive for students.

#### REFUSAL RIGHTS

All Participants invited to partake in this research have a right to opt in or out at any point in time. There would be no coercion or any form of repercussion to their refusal to participate.

#### ANONYMITY, PRIVACY AND CONFIDENTIALITY

The study would involve collecting data from participants through questionnaires and Participants would be assured that any information given during the study would be used for the purpose of research alone. Information collated in the process will be treated with maximum confidentiality. Only the researchers will have access to the details of participants.

#### CONSENT

After approval by the ethics committee of the teaching hospital, informed consent will be obtained from the participants. Participants will be provided with information on risks, benefits, privacy and anonymity in the language they will understand.

#### CONFLICT OF INTEREST

This research will be sponsored and fully funded by the organizers of the project.

#### RESULT

A total of 500 students from 4 different hostels of UNN (IBIAM, GH, IMOKE, NUGA) participated in the study. All the students gave assent to participate and 100% completed the questionnaires although variable number of students did not fill in some responses.

#### 4.1 SOCIODEMOGRAPHIC CHARACTERISTICS OF THE STUDENTS

Table 1: Demographic characteristic

VARIABLE	FREQUENCY	PERCENTAGE
<b>AGE</b>		
16 - 20YRS	85	17.0
21 - 25YRS	356	71.2
26 - 30YRS	53	10.6
31- 35YRS	4	.8
>35YRS	2	.4
<b>TOTAL</b>	500	100.0
<b>SEX</b>		
MALE	267	53.4
FEMALE	233	46.6
<b>TOTAL</b>	500	100.0

<b>MARITAL STATUS</b>		
<b>SINGLE</b>	490	98.0
<b>MARRIED</b>	10	2.0
<b>TOTAL</b>	500	100.0
<b>RELIGION</b>		
<b>CHRISTIAN</b>	497	99.4
<b>MUSLIM</b>	3	.6
<b>TOTAL</b>	500	100.0
<b>PLACE OF RESIDENCE</b>		
<b>HOSTEL</b>	493	98.6
<b>OFF-CAMPUS</b>	7	1.4
<b>TOTAL</b>	500	100.0
<b>ETHNICITY</b>		
<b>IGBO</b>	460	92.0
<b>HAUSA</b>	3	.6
<b>YORUBA</b>	8	1.6
<b>OTHERS</b>	29	5.8
<b>TOTAL</b>	500	100.0
<b>YEAR OF STUDY</b>		
<b>200L</b>	41	8.2
<b>200L</b>	55	11.0
<b>400L</b>	105	21.0
<b>500L</b>	174	34.8
<b>600L</b>	125	25.0
<b>TOTAL</b>	500	100.0
<b>HALL OF RESIDENCE</b>		
<b>NUGA</b>	125	25.0
<b>IMOKE</b>	126	25.2
<b>GHD</b>	125	25.0
<b>IBIAM</b>	124	24.8
<b>TOTAL</b>	500	100.0
<b>RECEIVE ALLOWANCE</b>	<b>UPKEEP</b>	
<b>YES</b>	460	92.0
<b>NO</b>	40	8.0
<b>TOTAL</b>	500	100.0
<b>AMOUNT OF UPKEEP ALLOWANCE RECEIVED PER MONTH</b>		
<b>&lt;10,000</b>	46	10.0
<b>N10,000 - N20,000</b>	130	28.3

N21,000 - N30,000	81	17.6
N31,000 - N50,000	146	31.7
>N50,000	57	12.4
<b>TOTAL</b>	460	100.0

Majority (71.2%) of the respondents were age 21-25 years. Over half (53.4%) of the respondents were male and 98.6% of them lives in the hostel regularly. Most responders (34.8%) are in their 500 level of study, and 92.0% of the responders are single and of Igbo ethnicity. 92.0% of the responders received upkeep allowance and majority of them falls among the range (N 31,000 – 50,000) per month. [Table 1].

### AWARENESS OF HOSTEL SANITATION

Table 2: Students Awareness of Hostel Sanitation

Hostels	Awareness of the term hostel sanitation			
	Yes	NO	Total	P-value
NUGA	124(99.2)	1(0.8)	125(100.0)	0.198
IMOKE	123(98.4)	2(1.6)	125(100.0)	
GH	121(96.8)	4(3.2)	125(100.0)	
IBIAM	119(95.2)	6(4.8)	125(100.0)	

It is obvious that a large population of the occupants in the various hostels are aware of the term Hostel Sanitation. As stated above, (99.2%) of NUGA population are aware, (98.4%) of IMOKE population are aware, (96.8%) of GH population are aware and (95.2%) of IBIAM population are aware [Table 2].

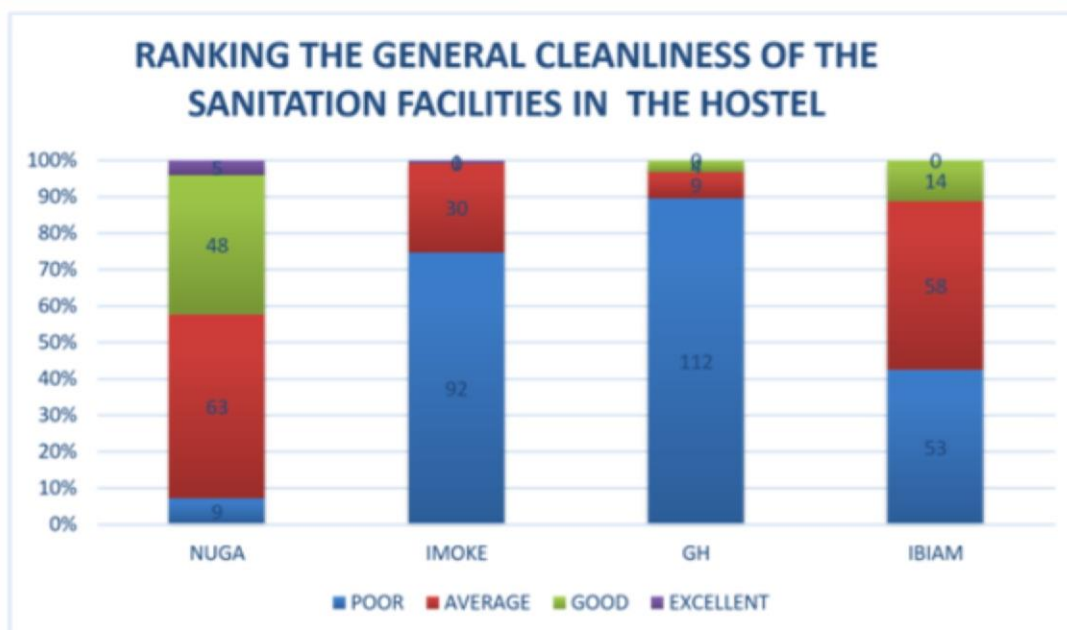
**Table 3: Perceived hygiene condition of the Hostel toilet**

*Hygienic conditions of your hostel toilet*

## Hostels

	Good	Poor	Not sure	Total	P-value
<i>NUGA</i>	106(84.8)	15(12.0)	4(3.2)	125(100.0)	0.000
<i>IMOKE</i>	4(3.2)	19(95.2)	2(1.6)	125(100.0)	
<i>GH</i>	5(4.0)	117(93.6)	3(2.4)	125(100.0)	
<i>IBIAM</i>	26(21.1)	86(69.9)	11(8.9)	123(100.0)	

The Perceived Hygiene condition of the Hostel toilet varied widely amongst the various hostel most likely because of the structural development of the hostels. 84.8% of NUGA Hostel respondents reported that the hostel hygiene is Good, 12% said it is Poor and 3.2% said they were not sure. 95.2% of IMOKE Hostel respondents reported that the hostel hygiene is Poor, 4% said it is Good and 2% said they were not sure. 93.6% of GH Hostel respondents reported that the hostel hygiene is Poor, 4% said it is Good and 2.4% said they are not sure. 69.9% of IBIAM Hostel respondents reported that the hostel hygiene is Poor, 21.1% said it is Good and 8.9% said they are not sure.



**Figure 1: Showing Ranking of the general cleanliness of the sanitation facilities in the hostel**

The above figure illustrates the ranking of the different hostel of studies on their sanitation facilities. In NUGA and IBIAM majority 63 (50.4%) and 58 (46.4%) respectively of their hostel sanitation facilities are average. While in IMOKE and GH, majority 92 (73.6%) and 112 (89.6%) respectively are poor.

None of the responders from IMOKE had excellent satisfaction of their hostel sanitation facility.

**Table 4: General cleanliness of the hostel toilet**

<b>VARIABLES</b>	<b>NUGA</b>	<b>IMOKE</b>	<b>GH</b>	<b>IBIAM</b>
<i>n</i> = 125	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
<b><i>Disturbed by the poor hostel sanitation</i></b>				
Yes	77(61.6)	121(96.8)	103(82.4)	113(90.4)
No	48(38.4)	4(3.2)	22(17.6)	12(9.6)
<b><i>Spillage of the floor of the toilet with faeces</i></b>				
Yes	6(4.8)	88(70.4)	95(76.0)	29(23.2)
No	119(95.2)	37(29.6)	30(24.0)	96(76.8)
<b><i>Toilet floor wet with water and urine</i></b>				
Yes	5(4.0)	106(84.8)	118(94.4)	93(74.4)
No	120(96.0)	19(15.2)	7(5.6)	32(25.6)
<b><i>Breakage of sewage hostel pipes</i></b>				
Yes	26(20.8)	93(74.4)	20(16.0)	59(47.2)
No	63(50.4)	10(8.0)	35(28.0)	23(18.4)
Not sure	36(28.80)	22(17.6)	70(56.0)	43(34.4)

Each of the 4 selected hostels had 125 participants.

For the participants who were disturbed by the poor hostel sanitation, the students who lived in IMOKE hostel were the most disturbed with 121 (96.8%) of the residents agreeing to this. The residents of NUGA hostel were the least disturbed with 77(61.6%) agreeing to this.

For the residents who reported that there was spillage of the floors of their toilets with faeces, 95(76.0%) of the residents of the GH hostel agreed to this being the highest while the residents of NUGA were the least with 6(4.8%) participants agreeing.

GH hostel had the most reports of toilet floors that were wet with urine and water -118(94.4%) while NUGA hostel had the least reports-5(4.0%).

IMOKE hostel had the most reports of broken sewage pipes with 93(74.4%) being aware of this. GH hostel had the least reports of broken sewage pipes-20(16.0%) because 70 (56.0%) residents were not sure of the state of their sewage pipes.[Table 4]

## FACTORS INFLUENCING HOSTEL SANITATION

Table 5a: Room occupancy rate

Hostels	Room occupancy rate						Pvalue
	1	2	4	6	10	Total	
NUGA	7(5.8)	104(86.0)	7(5.8)	1(0.8)	2(1.7)	121(100.0)	0.000
IMOKE	2(1.6)	1(0.8)	6(4.8)	83(66.4)	33(26.4)	125(100.0)	
GH	0(0.0)	7(6.0)	91(78.4)	16(13.8)	2(1.7)	116(100.0)	
IBIAM	2(1.6)	28(22.8)	78(63.4)	13(10.6)	2(1.6)	123(100.0)	

Of 500 respondents who provided responses about the room occupancy rate. In NUGA hostel all of the respondents are 2 in a room. While in IMOKE hostel majority of the respondent 83/125 are 6 in a room. In GH hostel 91/116 (78.4%) are 4 in a room while in IBAIM hostel 78/123 (63.4%) are 4 in a room.

Table 5b: Reported sanitary condition of students hostels and toilets

VARIABLES	NUGA	IMOKE	GH	IBIAM
<i>n = 125</i>	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
<i>Lack of running water in the hostel</i>				
Yes	112(89.6)	122(97.6)	102(81.6)	120(96.0)
No	13(10.4)	3(2.4)	23(18.4)	5(4.0)
<i>Flushing the toilet every single time its use</i>				
Yes	94(75.2)	13(10.4)	91(72.8)	84(67.2)
No	31(24.8)	112(89.6)	34(27.2)	41(32.8)
<i>Regular cleaning of the Hostel toilets</i>				
Yes	89(71.2)	14(11.2)	20(16.0)	27(21.6)
Sometimes	27(21.6)	77(61.6)	23(18.4)	74(59.2)
No	9(7.2)	34(27.2)	82(65.6)	24(19.2)

*Types of toilet facilities the hostel**Flush/pour-flush toilet**Bucket latrine**Availability of cleaning materials for cleaning*

Yes

No

Not sure

*The sweeping of the hostel corridor responsibility**Occupants of the room**The cleaners**The sufficiency of hostel toilets for the number of students*

Yes

No

Don't know

*Availability of soap and water for hand washing after using the toilet*

Yes

No

Don't know

*Paid official hostel maintenance fee*

Yes

No

125(100.0) 114(91.2) 124(99.2) 120(96.0)

0(0.0) 11(8.8) 1(0.8) 5(4.0)

82(65.6) 24(19.2) 10(8.0) 38(30.4)

21(16.8) 43(34.4) 96(76.8) 25(20.0)

22(17.6) 58(46.4) 19(15.2) 62(49.6)

12(9.6) 15(12.0) 8(6.4) 12(9.6)

113(90.4) 110(88.0) 117(93.6) 113(90.4)

85(68.0) 23(18.4) 9(7.2) 11(8.8)

28(22.4) 83(66.4) 103(82.4) 103(82.4)

12(9.6) 19(15.2) 13(10.4) 11(8.8)

67(53.6) 9(7.2) 2(1.6) 14(11.2)

19(15.2) 8(6.4) 1(0.8) 13(10.4)

39(31.2) 108(86.4) 122(97.6) 98(78.4)

104(83.2) 101(80.8) 25(20.0) 116(92.8)

21(16.8) 24(19.2) 100(80.0) 9(7.2)

Each of the 4 selected hostels had 125 participants.

When asked about the availability of running water in the hostel, most of the occupant in the 3 hostels said “yes” to the lack of running water with NUGA occupants having 112(89.6%) of 123 respondents, IMOKE occupants- 122(97.6%) of 122 respondents, GH occupants-102(81.6) of 124 respondents and IBIAM occupants having 120(96.0%).

Most of the IMOKE residents – 112(89.6%) of 125 respondents reported that the lack of running water makes them not to flush their toilet every time they use it. Few GH occupants- 34 of 125 respondents (27.2%) reported that they don't flush the toilet anytime they use it. Most of the NUGA respondents flushes the toilet anytime it is being use it with of the occupant still not flushing 94 of 125 respondents (75.2%) reported that their toilet is regularly flushed.

2 out of the 4 hostels reported that they all use pour flush except for the IMOKE hostel which few reported they use bucket latrine out of 11 (8.8%) of 125 respondents use bucket latrine

GH hostel has least number of 'yes' when asked for availability of cleaning materials for cleaning with 10 (8.0%) respondents answering 'yes'. NUGA had the highest number of 'yes' with 82 (65.6%). Each hostel had 125 complete responses.

Almost all the respondents reported that the cleaners are responsible for sweeping the hostel corridor. NUGA-113 out of 125 (90.4%), IMOKE—110 out of 125 (88.0%), GH--117 out of 125 (93.6%), IBIAM--113 out of 125 (90.4%).

**Table 6: Hostel environmental sanitation**

VARIABLES	NUGA	IMOKE	GH	IBIAM
<i>n = 125</i>	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
<i>Rating the sanitary conditions around food vendors around the hostel</i>				
<i>Poor</i>	17(13.8)	38(31.1)	104(83.9)	
<i>Average</i>	69(56.1)	78(63.9)	19(15.3)	
<i>Good</i>	35(28.5)	5(4.1)	1(0.8)	
<i>Excellent</i>	2(1.6)	1(0.8)	0(0.0)	
<i>Recall of any toilet related inflection in the past</i>				
<i>Yes</i>	11(8.8)	59(47.2)	15(12.0)	29(23.2)
<i>No</i>	114(91.2)	66(52.8)	110(88.0)	96(76.8)
<i>Bathroom comfortability</i>				
	22(17.6)	67(53.6)	30(24.0)	68(54.4)
<i>Recall of any toilet related inflection in the past</i>				
<i>Yes</i>	11(8.8)	59(47.2)	15(12.0)	29(23.2)
<i>No</i>	114(91.2)	66(52.8)	110(88.0)	96(76.8)
<i>Bathroom comfortability</i>				
	22(17.6)	67(53.6)	30(24.0)	68(54.4)
<i>Yes</i>	103(82.4)	58(46.4)	95(76.0)	57(45.6)
<i>No</i>				
<i>Badly smelling bathroom</i>				
<i>Yes</i>	26(20.8)	77(61.6)	101(80.8)	58(46.4)
<i>No</i>	99(79.2)	48(38.4)	24(19.2)	67(53.6)
<i>Perceived differences in sanitation status of medical and non-medical student hostel in UNEC</i>				
<i>Yes</i>	19(15.2)	3(2.4)	1(0.8)	75(60.0)
<i>No</i>	106(84.8)	122(97.6)	124(99.2)	50(40.0)
<i>Visiting friend's house to use their toilets</i>				
<i>Yes</i>	3(2.4)	2(1.6)	3(2.4)	2(1.6)
<i>No</i>	122(97.6)	123(98.4)	122(97.6)	123(98.4)



Each of the 4 selected hostels had 125 participants.

When asked to rate the sanitary conditions around the food vendors located near the hostels, 3 hostels gave an 'average' rating from most of their occupants with NUGA occupants having 69(56.1%) of 123 respondents, IMOKE occupants- 78(63.9%) of 122 respondents and IBIAM occupants having 71(56.8%). Out of 124 occupants of GH hostel who responded, most gave a 'poor' rating - 104(83.9%).

The most common health condition experienced by occupants of the four selected hostels was malaria with 78.6% (77 of 98 occupants who responded). Dysentery was the least experienced health condition of the four hostels.

IMOKE hostel had the most occupants with recall of toilet related infection suffered in the past- 59(47.2%) while NUGA hostel having the least experiences-11(8.8%).

Most of the IMOKE residents - 51(42.1%) of 121 respondents reported that the lack of good hostel sanitation had 'strong effects' on their student activities. Majority of the GH occupants- 103 of 124 respondents (83.1%) reported that the sanitary conditions of

the hostel 'sometimes' affected their activities while majority of the NUGA hostel residents- 37 of 120 respondents (30.8%) reported that it was 'not an issue'.

3 out of the 4 hostels reported that they noticed no difference between the medical hostels and the non-medical hostels in UNEC except for the IBIAM hostel with 75 out of 125(60.0%) respondents of the said hostel reporting that there is a difference.

Almost all the respondents reported 'no' when asked if they visited their friend's houses to use their toilets. NUGA-122 out of 125(97.6%), IMOKE—123 out of 125(98.4%), GH--122 out of 125(97.6%), IBIAM--123 out of 125(98.4%).

NUGA had the most negative results about their bathroom comfortability with 103 out of 125 (82.4%) respondents stating that it was not comfortable. IBIAM had the least negative results with 57 out of 125 (45.6%).

NUGA hostel has least number of 'yes' when asked if their bathrooms smelt bad with 26 (20.8%) respondents answering 'yes'. GH had the highest number of 'yes' with 101(80.8%). Each hostel had 125 complete responses.

## OBSERVATIONAL CHECKLIST

**Table 7: Actual Observation on status of hostel sanitation**

### GENERAL

Variable	Frequency	Percentage
<b>Hostels</b>		
GH	1	25.0
LADY IBIAM	1	25.0
IMOKE	1	25.0
NUGA	1	25.0
Total	4	100.0
<b>Number of Rooms</b>		
100.00	1	25.0
140.00	1	25.0
160.00	1	25.0
200.00	1	25.0
Total	4	100.0
<b>Height</b>		
2.70	2	50.0
4.27	1	25.0
4.70	1	25.0
Total	4	100.0

<b>Width</b>		
2.93	1	25.0
3.60	1	25.0
3.65	2	50.0
Total	4	100.0
<b>How many people to each room</b>		
2.00	1	25.0
4.00	2	50.0
5.00	1	25.0
Total	4	100.0

## WATER AVAILABILITY

Variable	Frequency	Percentage
<b>Is there water available</b>		
Yes	3	75.0
No	1	25.0
Total	4	100.0
<b>Source of water</b>		
Tank	2	50.0
well, tank	1	25.0
well, tank	1	25.0
Total	4	100.0
<b>Is the water connected to the room</b>		
Yes	0	0.00
No	4	100.0
<b>If no, how do you access the water</b>		
Buying	2	50.0
fetch from well	2	50.0
Total	4	100.0
<b>Do they have to fetch it with buckets</b>		
Yes	4	100.0

No	0	0.00
<b>Are there bushes all around the place</b>		
Yes	3	75.0
No	1	25.0
Total	4	100.0
<b>If yes, are they neatly cut</b>		
Yes	1	25.0
No	3	75.0
Total	4	100.0

## ENIRONMENTAL SANITATION

Variable	Frequency	Percentage
<b>Are the corridors neat</b>		
Yes	2	50.0
No	2	50.0
Total	4	100.0
<b>Are the corridors littered</b>		
Yes	2	50.0
No	2	50.0
Total	4	100.0
<b>Is there waste bin</b>		
Yes	3	75.0
No	1	25.0
Total	4	100.0
<b>Do they cook on the corridor</b>		
Yes	3	75.0
No	1	25.0
Total	4	100.0
<b>Are the corridors clustered with item</b>		
Yes	3	75.0
No	1	25.0
Total	4	100.0

<b>Do they have doors</b>		
Yes	2	50.0
No	2	50.0
Total	4	100.0
<b>If yes can the close</b>		
Yes	2	50.0
No	2	50.0
Total	4	100.0
<b>Can one boat the door form inside</b>		
<b>Yes</b>	0	0.00
<b>No</b>	4	100.0
<b>Is the floor and walls clean</b>		
Yes	2	50.0
No	2	50.0
Total	4	100.0

## BATHROOM/ TOILET FACILITY

Variable	Frequency	Percentage
<b>Are the surroundings smelling</b>		
Yes	2	50.0
No	2	50.0
Total	4	100.0
<b>How many rooms are to one bathroom</b>		
1.00	1	25.0
4.00	2	50.0
10.00	1	25.0
Total	4	100.0
<b>Who are those responsible for keeping it clean</b>		
Cleaner	3	75.0
Roommates	1	25.0
Total	4	100.0
<b>Do the bathroom drain well</b>		
Yes	3	75.0
No	1	25.0

Total	4	100.0
<b>How many rooms to one toilet</b>		
1	1	25.0
4	1	25.0
5	1	25.0
10	1	25.0
Total	4	100.0
<b>Type of toilet system (Water cistern)</b>		
Yes	4	100.0
No	0	0.00
<b>Do they use improvised container</b>		
Yes	2	50.0
No	2	50.0
Total	4	100.0
<b>If yes, how do they dispose it</b>		
sewage disposal	2	50.0
Total	2	100.0
<b>How do the ladies dispose their sanitary pad after use</b>		
Dustbin	3	75.0
waste bin	1	25.0
Total	4	100.0

## SEWAGE DISPOSAL

Variable	Frequency	Percentage
<b>Functionality (how its flushed)</b>		
Poor flush	4	100.0
<b>Is floor clean</b>		
Yes	2	50.0
No	2	50.0
Total	4	100.0
<b>Is floor dry</b>		
Yes	3	75.0
No	1	25.0
Total	4	100.0

<b>Is floor littered</b>		
Yes	2	50.0
No	2	50.0
Total	4	100.0
If yes, specify		
tissue, faeces	1	25.0
water, urine	1	25.0
Total	2	100.0
<b>Is the toilet environment smelling</b>		
Yes	3	75.0
No	1	25.0
Total	4	100.0
<b>Is the toilet bowl clean</b>		
Yes	1	25.0
No	3	75.0
Total	4	100.0
<b>Is the toilet filled or solid with faeces</b>		
Yes	2	50.0
No	2	50.0
Total	4	100.0
<b>Is the septic tank broken</b>		
Yes	2	50.0
No	2	50.0
Total	4	100.0
<b>Does the area around it smell</b>		
Yes	3	75.0
No	1	25.0
Total	4	100.0
<b>Is the pipe broken</b>		
Yes	2	50.0
No	2	50.0
Total	4	100.0
<b>Inspection chamber of the soak away</b>		
Closed	4	100.0

Indicate any other findings during observation	your	
improper drainage of gutters in the quadrangle	1	25.0
pouring of water, urine from the corridors	1	25.0
rooms are shared to since there is accountability of activities carried out in the room	1	25.0
Total	3	100.0

This was actually conducted by the research team (I and my project mate) when we visited the four various hostels to ascertain the level of sanitation in them without any third party.

From the table above, NUGA hostel had more rooms (200) than the other three hostels, while GH hostel had the least numbers of rooms (100). GH and LADY IBIAM hostel has the same height and weight (2.70 x 2.93), while IMOKE and NUGA hostel's height and weight are approximately the same, 4.27 x 3.60 and 4.70 x 3.65 respectively. Number of persons to a room in NUGA hostel is 2 at maximum while for the other hostels it ranges from 4 – 5 persons in a room

All the hostels have problem with water availability. Their major source of water is well and tank water. The tank water is bought and fetched with buckets and kegs. The well water is fetched only in NUGA and GH hostel and there are bushes around its vicinity.

The toilet surrounding of GH and LADY IBIAM hostel smells while that of IMOKE and NUGA doesn't. 10 rooms are assigned to a toilet in GH, 4 rooms are assigned to a toilet both in LADY IBIAM and IMOKE hostel, while in NUGA hostel only a room is attached to a toilet. All uses water cistern as toilet system (poor flush), but occasionally the LADY IBIAM and female occupants of IMOKE uses improvised containers. Majority (75%) of the ladies in this hostel don't dispose their sanitary pads into the toilet bowl but rather inside the dustbin.

As regard their sewage disposal, 50% of the septic tank pipe is broken and the area smells in GH and LADY IBIAM. All their soak away inspection chambers are closed. Improper drainage of gutters in the quadrangle, pouring of water and urine was observed in LADY IBIAM and GH hostels.

The observation checklist almost corresponds with our survey of the hostels.

## DISCUSSION

The study is a comparative assessment of the sanitary conditions of students' hostels at Enugu Campus and ItukuOzalla campus of UNN. A total of 500 students from 4 different hostels (125 of each of which 2 hostels were strictly for medical students) participated in this study.

From the results, Hostels have been provided though not enough for the number of the students admitted. Some rooms had 2-man occupancy rate in their hostels particularly the medical students while some had 4/5-man occupancy rate if not more. it is obvious that a good majority of the students are aware of what hostel sanitation means and entails but the state of the sanitary conditions of the hostels is averagely poor. Based on the availability of sanitation or hostel facilities, cleaning equipment such as waste bins were provided and paid cleaners and workers were placed to monitor and clean the hostels when appropriate and of course the students are expected to do their part- little cleaning of their personal spaces and throw things in the appropriate places. With all these, the hostels were still in poor shape. Coming from outside to

inside, most of the hostels had uncut grasses which were very high and untidy which could serve as hiding areas for unwanted creatures such as snakes and mosquitoes which are harmful to health and life in general. Sewages tanks were broken and were emitting very harsh toxic smell from the decomposing waste products, breeding bacteria and so much more which the students inhale on a daily basis as they were located close to the hostel windows. There was also inappropriate drainage of gutters augmenting the smell already existing. Some of the hostel surroundings reeked of stale urine smell indicating that some students still found urinating outside more convenient than using the toilet facilities provided for them. Some of the hostels had their corridors littered with waste either from the non-chalant attitude of the students towards proper waste disposal or just from the fact that the waste bins were over filled and buried with waste and this left them with no other alternative but to continue dumping them in that untidy fashion. The corridors were also cluttered with student properties and it was noted that most preferred to cook in the corridors as no appropriate cooking area was provided for the students. Cooking utensils, condiments and unwashed plates could

be found about serving as attraction for rats and the likes that hide in the tightly congested corridors. Water was also spilled on the corridors mostly from spillage while students fetched water with their buckets. The students also mentioned that sweeping and cleaning of the corridors was the sole task of the cleaners which was done on a day-to-day basis probably paid on their schedule but it was still untidy due to the student activities and behavior and rapid production of waste materials. The sanitary conditions of the food vendors in the hostel were also noticed to be poor and this could affect the health of the students as they are avenues for food poisoning. Despite the fact that there were few complaints of diarrhea, malaria was noticed to be the most frequently experienced health condition probably due to the untidy hostel environment and because it is a malaria endemic area.

Based on the water supply, water was provided in the hostels but not proportional to the adequate need of every student as most people complained of lack of water (more than 80% from the 4 hostels). They do not have water running in their rooms other areas and so have resorted to buying water from vendors who own tanks for the respective hostels. Those who could not afford to buy water on a daily basis, make use of the well which may not be clean or readily available since it is affected by the season at that time. They mentioned that the well water was mainly for flushing toilets but never for cooking because of the health implications. The cleaners and the students have to fetch water in buckets or gallons to carry out their work and daily chores respectively.

The outcome of the hostel sanitary conditions is the way it is because of the lack of maintenance from the school in terms of routinely supervising the hostels and fixing the damaged facilities like septic tanks, broken toilets and so on. If they also allocated funds yearly for things like this, it would be easier to maintain in the long run. More hostels should be created proportional to the students so that fewer students would be allocated to rooms and be held accountable for the cleanliness of our areas but there may not be funds for this. The hostel supervisors and porters are not cautioned as inspections are not carried out routinely. Students are not asked about their welfare and changes they would like to be put in effect. The cleaners are not paid as they should and are even being owed most time but yet try to show up so it would be no surprise that they work haphazardly either working in parts or not showing up at all. Cleaning materials are not also provided and changed from time to time. Water availability which is also needed for daily sanitation is also lacking. The contracted gardeners are not also called regularly to cut the grasses and serve as breeding areas for insects and animals. Water cannot really be addressed as the area is not one with availability of water. Water prices are on the high side due to scarcity and reservoirs are not put in place for each hostel.

On the part of the students, the hostel executives are not up and doing with regards to checking and holding people accountable for the littered areas and water spills. Defaulters are not also appropriately fined for irresponsible behavior. The food vendors are not held accountable and reported by the students when they are

not being hygienic or up to standard. All these and particularly the crowding of students in few hostels are the reasons for the poor state of sanitary conditions and water. It is worthy of note that there were less complaints of these problems from the final year medical students as they were few allocated with rooms that had bathrooms and so are held accountable for the state of their hostels.

A study done in the female hostels of University of Maidguri, Borno state by Pat U Okpala et al showed that the students also felt that the sanitary conditions of the hostel was poor because of lack of basic elements like safe water and basic sanitation rules like proper refuse disposal were not adhered to. They also made mention of inadequate personnel and identification of diseases associated with poor hostel conditions<sup>31</sup>.

Another study in University of Kano male hostels by RM Musa et al, it was evident from the data obtained that there were no adequate personnel to keep the hostels clean, no regular water supply, lack of waste disposal facilities and lack of maintenance of hostel facilities and majorly due to the student's poor attitude to keeping their hostel clean<sup>32</sup>.

A study done on the Sanitation practices among undergraduate students at the university of Benin, Nigeria by EO Igudia et al showed also that sanitation practices by students were poor and factors like age and gender influenced it. It was also found that inadequate water supply, poor toilet facilities, insufficient toilets, poor drainage system and so much more were major causes of the poor sanitation of the hostel residency<sup>33</sup>.

When comparing our results with other studies from different institutions, it is obvious that the same factors are responsible for the poor sanitary conditions of the hostels. So, it is not peculiar to our institution alone.

As regards to the Awareness towards hostel sanitation, it is very obvious that a large majority of the hostel occupants in NUGA, IMOKE, GH and IBIAM are aware of it.

For the Hygienic conditions in the various hostels, it is clear that NUGA has the best hygiene when compared to other hostel and with GH having the worst hostel hygiene.

The main reason why the hostels turned out to have such result is because of the structure of the hostel. NUGA having an in-built bathroom seems to have made a large impact on its hygiene while other hostels sharing a common / public hostel made it a lot worse. Because at NUGA, the individual can keep his/her room in a very good condition without any difficulty, but at IMOKE/GH/IBIAM you cannot do that.

And also, when things like strike come up in the campus, the hostels like IMOKE, GH and IBIAM will be left unclean till the cleaners resume work. This makes it so much worse, but at NUGA the room and bathroom are the individual's responsibility except the s



surrounding environment were the cleaners keep it clean.

Comparing our findings with an article on Sanitation Practices among undergraduate students at University of Benin, Nigeria, it is clear that students in UNN have a better understanding about what hostel sanitation is all about because when compared to University of Benin, they have a very poor knowledge and negative attitude towards sanitation practices<sup>33</sup>.

Also, on an article on Assessment of the Sanitation Status in a Tertiary Institution in Southeastern Nigeria (Federal University of Technology, Owerri, Nigeria) It is important to note that both universities are aware about hostel sanitation, its merits and demerits. Furthermore, the Federal University of Technology, Owerri, Nigeria seems to have put in a much better effort into providing a better sanitation environment for their students than the University of Nigeria Nsukka<sup>34</sup>.

As regards to factors influencing hostel sanitation it has been noted that the number of occupants in a room and the number of students per toilet are the major factors which affects hostel sanitation. From the studies NUGA hostel which has the lowest room occupancy has been noted to has better sanitary condition as regards to other hostels IMOKE, GH and LADY IBIAM.

The major reason why NUGA hostel turned out to have such result is because of the following reasons:

1. The total number of students living in the hostel.
2. The room occupancy rate. The maximum number of occupants in NUGA hostel is two students while in other hostel is about 5 students per room
3. The number of students per toilet. In NUGA, two students per toilet. While in other hostels is more of a general toilet.

This study reveals that the major cause of poor sanitary practices in UNEC hostels are number of hostel occupants, number of room occupants, number of toilets per students, shortage of water supply, poor drainage system. This agrees with the finding of Musa and Haque that regular water supply and student attitude contribute to the poor sanitary condition in the hostel<sup>32</sup>.

#### LIMITATIONS OF STUDY

The major limitation was the fact that part of our assessment is self-report from the respondents who may be bias in reporting their actual practices.

#### CONCLUSION

In conclusion, the sanitary conditions of students' hostel at the Enugu campus and ItukuOzalla campus of UNN are poor for hostels in ENUGU campus (GH, LADY IBIAM, IMOKE) but average for ItukuOzalla campus. The main reason identified for this

observation are: overcrowding in the hostels (high room occupancy rate), few toilet facilities for many students and inadequate water supply for sanitation.

#### RECOMMENDATIONS

In line with the findings in this study, we recommend the following;

1. More hostels should be built to accommodate the theming population of students offered admission into higher intuition of learning
2. The room occupancy rate should be reduced to at most 2 persons and not more than 2 rooms to be allocated to a toilet
3. Water should be made available in the hostel by the school governing body via private and government partnership.
4. Educating the students on the importance cleanliness and its effect on health.

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## Perception Of Risk And Barriers To Cervical Cancer Screening Among Women Attending Antenatal Care In University Of Nigeria Teaching Hospital (UNTH), Ituku-ozalla, Enugu State.

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### ABSTRACT

**OBJECTIVES:** To assess the perception of risk to cervical cancer and barriers to cervical cancer screening and HPV vaccination among women attending antenatal care in UNTH.

**METHODOLOGY:** A descriptive cross-sectional design was used to study the selected sample. The technique used was systematic sampling, a type of probability sampling. The tool used was an interviewer-administered, pretested, structured questionnaire distributed to the respondents.

**RESULTS:** A total of 285 pregnant women from University of Nigeria Teaching Hospital (UNTH), Ituku-Ozalla were studied. Out of the 285 pregnant women sampled, majority of them (54.7%) were between the ages of 21 and 30 years, followed by those aged between 31 and 40 years (38.5%). Most of the women assessed were degree holders (38.9%) and the monthly salary of most of them was in the range of N5,000 – N50,000. The results of our study show that the majority of the women studied have heard about cervical cancer (55.1%). There was a significant relationship between the awareness of cervical cancer in respondents and their educational attainments. ( $p < 0.005$ ) The perception of risk of cervical cancer was shown to be low as majority of the respondents (64.9%) are unaware of the human papilloma virus (HPV) that causes cervical cancer. In a similar manner, majority of them do not know that multiple sexual partners (51.2%), early age at first sexual intercourse (63.2%), cigarette smoking (67%) and early age at marriage (63.9%) can predispose an individual to cervical cancer. Also, many of them also do not know that oral contraceptive pills (71.2%) and HIV (60.4%) can expose an individual to cervical cancer. Most of the respondents (43.5%) do not know about cervical screening and majority of them (49.8%) do not know if it is a useful tool in the early detection of cervical cancer. Majority of the respondents (63.5%) have not undergone a pap smear in the past. Majority of the respondents strongly agreed that if the test was free and causes no harm, they will screen (44.9%), that more women need to be informed about cervical cancer screening (53.0%) and that they would like to know more about HPV vaccination (66.0%).

**CONCLUSION:** There is moderate awareness of cervical cancer among pregnant women attending antenatal care in UNTH, Enugu but there is poor perception of risk and poor uptake of cervical screening. There is also low awareness of vaccination to prevent cervical cancer and correspondingly low uptake among the respondents. The commonest observed barrier to cervical cancer screening uptake is the cost and safety while the commonest barriers to HPV vaccination were lack of awareness and cost of vaccination.

**RECOMMENDATIONS:** Cervical cancer represents a huge burden of non-infectious disease globally. Every year, there are 530,000 new cases of cervical cancer and an estimated 273,000 deaths from the disease worldwide making it the second commonest cause of malignancy in females following breast cancer but the commonest of gynecological malignancies.<sup>2</sup> In the light of this, we recommended health education to enlighten women especially uneducated women on cervical cancer screening, being that cervical cancer is a highly preventable disease. We also recommended that governments, especially in developing countries should make HPV vaccination free if possible or highly subsidized to increase uptake of the vaccine. Free cervical cancer screening services are also encouraged.

**KEYWORDS:** Cervical cancer, screen, vaccination, awareness, pregnant women.

### Background

Cervical cancer is an abnormal change and proliferation of cells of the cervix.<sup>1,2</sup> It is a potentially preventable disease and the second most common cancer among women worldwide. It is the most common malignancy of the female genital tract in the developing

countries and the third most common in developed countries.<sup>3-7</sup> Worldwide, cervical cancer accounts for about 500,000 new diagnoses and 273,000 deaths every year, of the new cases 80% occur in the developing countries.<sup>4</sup> About 85% of the 250,000 deaths recorded yearly from cervical cancer occur in developing

countries like Nigeria where the majority of cases present in the late stages of the disease.<sup>8,9</sup> Each year, approximately 10,000 women develop cervical cancer, and about 8,000 women die from cervical cancer in Nigeria. It is worrisome as all sexually active women are at risk for the development of cervical cancer.<sup>10</sup> The major cause of cervical cancer is the human papilloma virus (HPV), and the disease is sexually transmitted.<sup>11</sup> Women with many sexual partners and those whose partners have had many sexual consorts or have been previously exposed to the virus are most at risk of developing the disease.<sup>9</sup> Other risk factors include high parity, smoking, sexual initiation at an early age, and prolonged use of oral contraceptives.<sup>11</sup> Women infected with human immunodeficiency virus (HIV) are at higher risk of developing cervical cancer and experience more swift progression of the infection. Cervical cancer was categorized as an Acquired Immuno-deficiency Syndrome (AIDS) defining illness in 1993.<sup>12</sup> Symptoms of cervical cancer include, vaginal bleeding after intercourse, vaginal discharge with a foul odor, and so on; these appear in the advanced phases of the disease.<sup>13</sup> Early detection and prompt treatment of precancerous conditions provide the best possible protection against cervical cancer.<sup>14</sup> In developed countries with well-established screening programs, the incidences of cervical cancer have been reduced by 70-90%. Sporadic screening is being carried out in Nigeria using opportunist method for those who visit certain clinics.<sup>15</sup> The different methods of cervical cancer screening include Papanicolaou (Pap) smear, visual inspection of the cervix with acetic acid (VIA), HPV DNA test, and colposcopy. Colposcopy is not used as a primary screening test but it is combined with other tests.<sup>16</sup>

### Problem Statement

Cervical cancer is noted as the fourth most common cancer in women worldwide. According to WHO, In 2018, an estimated 570,000 women were diagnosed with cervical cancer worldwide and about 311,000 women were pronounced dead from the disease.<sup>1</sup> About 20% of the world's new cervical cancer cases are diagnosed in Africa each year, with approximately 120,000 new cases.<sup>17</sup> In Nigeria, the national incidence of cancer of the cervix is 250/100,000.<sup>9</sup> It is projected that in 2025, there will be 22,914 new cervical cancer cases and 15,251 cervical cancer deaths in Nigeria.<sup>18</sup> 312 out of 400 women screened for gynaecological cancer in a study done in University of Nigeria Teaching Hospital (UNTH), Enugu were noted to have cervical cancer.<sup>19</sup> The high burden of cervical cancer in developing countries, like Nigeria, is due both to a high prevalence of HPV infection and the lack of effective cervical cancer screening programmes. In cases where effective screening programmes are available, poor knowledge and negative health-seeking behavior of the populace have led to poor utilization of such services.<sup>15</sup> An important strategy towards the reduction of the incidence and mortality associated with cervical cancer is by increasing the screening rate of women that have not screened or those that screen infrequently.<sup>20</sup> Knowledge about cancer of the cervix and its screening is important in screening uptake. Women with low levels of knowledge about cervical cancer and its prevention are less likely to access screening services.<sup>5,9,14,21</sup>

In cases of cervical cancer, pre-malignant changes have no symptoms and are usually not noticeable on visual examination. The early stages of cervical cancer may be completely asymptomatic. However, by the time it is large enough to detect visually, it is usually symptomatic with abnormal bleeding often occurring after sexual intercourse. Later on, there may be watery or foul discharge that will be noticeable and resistant to most treatments for the usual vaginal infections.<sup>22</sup> Cervical cancers usually do not spread early. They tend to be slow growing and cause most of their problems in the pelvis.<sup>23</sup>

### Justification

The implementation of effective programmes aimed at cervical cancer prevention in developed countries in the past decades has helped reduce the incidence and mortality rate by up to 80%. These programmes include the 90-70-90 target by the World Health Assembly of WHO.<sup>21</sup> In developing countries however, cervical cancer still remains a major health problem even with the implementation of cervical cancer screening programs and the awareness of pre-invasive stage of the malignant condition. Sadly, majority of those diagnosed with cervical cancer never heard of it prior to the disease hence knew nothing of possible prevention and its risk factors. Cervical cancer is one of the most successfully treatable forms of cancer as long as it is detected early and managed effectively. An effective way of preventing cancer is primarily by HPV vaccination as well as health education and secondarily by screening for, and treating precancerous lesions. These will go a long way to prevent most cervical cancer cases. To increase the awareness level and screening coverage of cervical cancer, there is need to engage primary care approach.<sup>24</sup> This study aims to determine the awareness of cervical cancer, vaccination against HPV among women attending antenatal clinic. It also aims at identifying barriers to cervical cancer screening among women in developing countries like Nigeria, and thus, offer solutions to these challenges, so as to reduce the incidence and mortality rate of cervical cancer in our environment.

### Research Questions

1. Have women attending antenatal care (ANC) in UNTH heard about cervical cancer and what do they know about it?
2. Are women attending ANC in UNTH aware of HPV vaccine and Cervical Cancer screening and have they been vaccinated or screened before?
3. Among women attending ANC in UNTH and, what are the barriers to cervical cancer screening and HPV vaccination?
4. What interventions do they propose will reduce these barriers and facilitate adherence to follow-up after abnormal Cervical Cytology?

### General Objectives

To assess the perception of the risk to cervical cancer and barriers to cervical cancer screening and HPV vaccination among women attending antenatal care in UNTH.

### Specific Objectives

1. To assess the knowledge and determine their perception of risk to cervical cancer.
2. To determine the uptake of HPV vaccination and cervical cancer

screening.

3. To ascertain the determinants and barriers to HPV vaccination and cervical cancer screening.

## METHODOLOGY

### Study Area

This study was carried out among women attending Antenatal Care in University of Nigeria Teaching Hospital (UNTH), Ituku-Ozalla, Enugu State. Nigeria is a country in West Africa. It is the most populated country in Africa. It is geographically located between the Sahel to the north, and the Gulf of Guinea to the south in the Atlantic Ocean. It covers an area of 923,769 square kilometers, with a population of over 211 million. Nigeria borders Niger in the north, Chad in the northwest, Cameroon in the east, and Benin in the west. Nigeria is a federal republic comprising 36 states and the Federal Capital Territory, where the capital, Abuja, is located. Nigeria is a multinational state inhabited by over 250 ethnic groups speaking 500 distinct languages, all identifying with a wide variety of cultures. The three largest ethnic groups are the Hausa in the north, Yoruba in the west and Igbo in the east, together comprising over 60% of the total population. Nigeria is divided into six (6) geopolitical zones, one of which is the South-East zone. It is made up of five (5) states. Enugu state is one of the five states in the South-East zone of Nigeria. It is bordered to the north by the states of Benue and Kogi, Ebonyi state to the east, Abia State to the south, and Anambra State to the west. The state takes its name from its capital and largest city, Enugu. Enugu state is mainly inhabited by the Igbo speaking community and has the population of about 4,411,100 people according to the 2016 population census.

In Nigeria, the delivery of healthcare services is segmented across three levels of care within the public sector. These are primary, secondary and tertiary healthcare systems. This structure also reflects the three tiers of government in Nigeria, namely Local, State and Federal government. The University of Nigeria Teaching Hospital (UNTH) is a tertiary health Institution owned by the Federal government of Nigeria. It is located at Ituku-Ozalla, about 21 kilometers from Enugu metropolis. UNTH serves the people of old Eastern region and neighbouring northern states. An oncology centre (including radiotherapy facility) has been established at UNTH, Enugu to facilitate the treatment of cancer cases particularly for the South-east region and for other neighbouring states.

UNTH is one of the foremost centres for referrals in Enugu state and so attend to many of the pregnant women seeking antenatal care in Enugu State.

### Study Design

A descriptive cross-sectional study was carried out among women attending antenatal care in UNTH, Ituku-Ozalla, Enugu State.

### Study Population

The study population consists of women attending antenatal care in UNTH, Ituku-Ozalla, Enugu State.

### Inclusion/Eligibility Criteria

All pregnant women attending antenatal care in UNTH, Ituku-Ozalla, Enugu State.

### Exclusion Criteria

Those who came for ANC but did not consent to be part of the study.  
Those who are seriously sick.  
Those that have language barrier and an interpreter could not be found.

### Sample Size Determination

The sample size was estimated using results from a study on 'Women's Knowledge of Cervical Cancer and Uptake of Pap smear testing and the Factors Influencing it in a Nigerian Tertiary Hospital'.<sup>65</sup> The study demonstrated a prevalence (awareness rate) of cervical cancer and its screening was 78.5%.<sup>65</sup>

Using a confidence limit of 95% and a 5% margin of error, the sample size for the study was gotten using the Cochran formula;

$$n = Z^2 \times P(1-P) / d^2$$

The minimum sample size is thus calculated as

$$n = \frac{1.96^2 \times 0.785(1-0.785)}{0.05^2}$$

Where Z represents Confidence level which is 95% = 1.96

P represents Prevalence (awareness rate) of cervical cancer and its screening = 78.5%

d represents Margin of error tolerated which is 5% = 0.05

$$n = 1.96^2 \times 0.785(1-0.785) / 0.05^2$$

$$n = 0.64836604 / 0.0025 = 259.3464$$

$$n = 259$$

Hence, 259 subjects were needed for the study.

An additional 10% of the minimum sample size was added to mitigate for non-response;

$$= 259 + (10\% \text{ of } 259)$$

$$= 259 + 25.9$$

$$= 284.9$$

$$= 285$$

The minimum sample size was now 285.

### Sampling Technique

The sampling method that was used for sample collection was the systematic sampling method. University of Nigeria Tertiary Hospital, Ituku-Ozalla which is tertiary health facility, was purposively selected out of the tertiary health facilities in Enugu State. The data collection lasted for about 7 weeks, during which an estimated number of 500 women was expected to visit the facility for Antenatal care.

During the 7-week period, an estimated number of 500 women attending ANC at UNTH, divided by the minimum adjusted sample size (285) to give the sampling interval of 1.8, which approximates to 2. Hence, each ANC day, count was done in twos and every second patient counted was selected to be recruited for the study so far, they met our inclusion criteria. To avoid multiple participants recruitment, we confirmed whether the participants had visited the hospitals for ANC previously, and whether they had already participated in the study.

The study participants were recruited at the waiting rooms of the ANC clinic of the hospital and after getting consent from the participants, they were administered questionnaires to fill.

### Study Instruments

The instruments that were used for data collection were the pretested semi-structured interviewer-administered questionnaire adapted from a study on 'Knowledge, Attitude and Practices towards Cervical Cancer and Screening among Female Healthcare Professionals: A Cross-Sectional Study'.<sup>66</sup> It was drawn strictly based on extensive literature search on the knowledge and practice of cervical cancer screening and was constructed in English language. The questionnaire elicited questions on demographic data of the respondents, knowledge, screening practices and factors influencing the practice of cervical cancer screening. Section A obtained socio-demographic data of the respondents, section B obtained data on the knowledge and perception of risk of cervical cancer among the respondents, Section C obtained data on the prevalence of cervical cancer screening and HPV vaccination among the respondents, and Section D obtained data on the perceived barriers to cervical cancer screening and HPV vaccination among the respondents.

### Data Collection

Data was collected using a structured questionnaire which was interviewer-administered and were pretested beforehand among 5 randomly selected pregnant women attending ANC at Poly General Hospital, Asata, Enugu State, to ensure that there were no ambiguous questions and was modified accordingly to suit the objectives of the study. Informed consent was sought and obtained before the data collection. The questionnaire took about 10-15

minutes to be completed by each respondent. Questionnaires were issued and retrieved by members of the research group. The distribution of the copies of questionnaire to the pregnant women in the selected healthcare institution (UNTH) was done on the antenatal care visit days of Tuesday to Friday.

### Data Analysis

Data analysis was done using Statistical Package for the Social Sciences (SPSS) version 28.0 and was presented using tables, bar-charts and pie-charts.

### Ethical Consideration

The proposal was submitted to the Health Research and Ethics Review committee, University of Nigeria Teaching Hospital (UNTH), Ituku-Ozalla, Enugu State for ethical clearance. Permissions was sought and obtained from the Ministry of Health, Enugu State, and the hospital management of UNTH, to conduct the study. During the data collection, informed consent was obtained from the respondents in written form and the respondents were told what the research was all about and confidentiality was maintained. Also, respondents were told that they were free to pull out at any point during the study without any consequences. Participants were also assured of anonymity during and after the study. There was non-disclosure of personal information and respect of privacy. Questionnaires used for data collection were stored in locked cabinets and the data collected was stored in a passworded computer.

## RESULTS

TABLE 1: SOCIO-DEMOGRAPHIC DATA OF THE RESPONDENTS

Variable	Frequency	Percent
<b>Age</b>		
16 to 20 years	12	4.2
21 to 30 years	156	54.7
31 to 40 years	110	38.6
Above 40 years	7	2.5
<b>Marital status</b>		
Single	28	9.8
Married	248	87.0
Divorced	9	3.2
Others	No response	
<b>Religion</b>		
Christianity	277	97.2
Islam	8	2.8
<b>Educational attainment</b>		
Primary	22	7.7
WASSCE	80	28.1
Diploma	23	8.1
NCE	28	9.8
Degree	111	38.9
Masters	20	7.0
PhD	1	4

<b>Monthly Income</b>		
<N5000	18	6.3
N5000 to N50000	129	45.3
N50000 to N100000	80	28.1
N100000 to N200000	48	16.8
>200000	10	3.5
<b>Ethnicity</b>		
Igbo	249	87.4
Hausa	13	4.6
Yoruba	18	6.3
Others	5	1.8

Table 1 represents the demographic characteristics of women attending the antenatal clinic in UNTH. Their ages have a mean and standard deviation of 2.39 and 0.610 respectively. Virtually, most of the women were Igbos (97.4%), Married (87%) and were Christians (97.2%). Most of them were also degree holders (38.9%) and the monthly salaries of most of them fall between N5000-N50000 (45.3%).

**TABLE 2: KNOWLEDGE AND PERCEPTION OF RISK OF RESPONDENTS TO CERVICAL CANCER**

Variable	Frequency	Percent
<b>Knowledge of cervical cancer</b>		
Yes	157	55.1
No	116	40.7
I don't know	12	4.2
<b>History of cervical cancer</b>		
Yes	9	3.2
No	237	83.2
I don't know	39	13.7
<b>History of cervical cancer in first degree relative</b>		
Yes	15	5.3
No	191	67.0
I don't know	79	27.7
<b>Human papilloma virus (HPV) is the major cause</b>		
True	97	34.0
False	3	1.1
I don't know	185	64.9
<b>Having multiple sexual partners is a risk factor</b>		
True	137	48.1
False	2	7.0
I don't know	146	51.2
<b>Early age at first sexual intercourse is a risk factor</b>		
True	100	35.1
False	5	1.8
I don't know	180	63.2
<b>Cigarette smoking is a risk factor</b>		
True	75	26.3
False	19	6.7
I don't know	191	67.0
<b>Early age at marriage is a risk factor</b>		
True	87	30.5
False	16	5.6
I don't know	182	63.9
<b>Taking Oral contraceptive pills is a risk factor</b>		
True	63	22.1
False	19	6.7
I don't know	203	71.2
<b>HIV infection is a risk factor</b>		
True	104	36.5
False	9	3.2
I don't know	172	60.4



Table 2 represents the knowledge and perception of risk to cervical cancer that the women have. From the table obviously, majority of them have heard of what cervical cancer is (55.1%), but do not have a history of cervical cancer (83.2%). Most of them do not have any first degree relative with a history of cervical cancer (67%). It appears that majority of them of them are unaware that cervical cancer is actually caused by the human papilloma virus (64.9%). It also appears that majority of them do not know that multiple sexual partners, early age at first sexual intercourse, cigarette smoking and early age at marriage can expose one to cervical cancer i.e. (51.2%), (63.2%), (67%) and (63.9%) respectively. Majority of them do not also know that Oral contraceptive pills and HIV can expose and increase the risk of developing cervical cancer i.e., 71.2% and 60.4% respectively.

**TABLE 3: UPTAKE OF CERVICAL CANCER SCREENING AND HPV VACCINATION**

Variable	Frequency	Percent
<b>Aware of Pap smear test</b>		
Yes	119	41.8
No	124	43.5
I don't know	42	14.7
<b>If Pap smear test is a useful detection tool</b>		
Yes	113	39.6
No	25	8.8
I don't know	142	49.8
<b>Age Pap smear test be started</b>		
From birth	9	3.2
From puberty	70	24.6
From 20 years	30	10.5
From 30 years	13	4.6
After menopause	2	7.0
I don't know	161	56.5
<b>Undergone a Pap smear test before</b>		
Yes	39	13.7
No	181	63.5
I don't know	50	17.5
<b>If yes, how often do you do a Pap smear test</b>		
Monthly	4	1.4
Yearly	39	13.7
After menopause	2	7.0
Not sure	1	1.1
<b>If no, why?</b>		
I see no reason for the test	37	13.0
I am afraid of the procedure	29	10.2
I am afraid of the bad results	23	8.1
Don't know whom to consult	83	29.1
Others	43	15.1
<b>Best time for a Pap smear test</b>		
During menstrual flow	7	2.5
A week after period	92	32.3
During pregnancy	31	10.9
During breastfeeding	5	1.8
Not sure	149	52.3
<b>When a Pap smear test result is bad, what should be done</b>		
Leave it to God and pray	7	2.5
Do some more test	128	44.9
Not sure	141	49.5
Others	7	2.5
<b>Aware of HPV vaccination</b>		
Yes	102	35.8
No	180	63.2
<b>Are you vaccinated against HPV</b>		
Yes	35	12.3
No	199	69.8
Not sure	49	17.2
<b>No need for Pap smear screening after HPV vaccination</b>		
True	25	8.8
False	59	20.7
Not sure	201	70.5
<b>Age HPV vaccine should be taken</b>		
9 to 13 years	100	35.1
14 to 20 years	90	31.6
>20 years	93	32.6

Table 3 represents how prevalent cervical cancer screening and HPV vaccination is among the women attending ANC in UNTH. Virtually, most of them do not know or have not heard what cervical cancer screening is about neither do they know if it is a useful tool in the early detection of cervical cancer i.e., 43.5% and 49.8%. Majority of them, have not undergone a pap smear test in the past and also do not know at what age a pap smear test should be started (63.5% and 56.5% respectively). Majority of them are not sure of the best time to undergo a Pap smear test (52.3%). Most of them, do not if HPV can be vaccinated against and are not also vaccinated (63.2% and 69.8% respectively). Majority of them are not sure if there is no need for Pap smear screening after the HPV vaccine (70.5%) and do think that the best time to take the vaccine is between the ages of 9-13 years (35.1%).

**FIGURE 4.1: AWARENESS OF PAPSMEAR TEST**

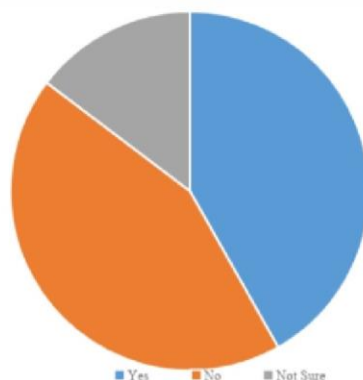


Figure 4.1 represents the percentages for the awareness of the Pap Smear Test for Cervical cancer screening among women attending ANC at UNTH, Ituku-Ozalla. From the figure above, we can see that majority of the are not aware of Pap smear test for cervical cancer screening (43.5%), 41.8% of them are aware, while some were not sure if they were aware or not (14.7%).

**FIGURE 4.2: AWARENESS OF HPV VACCINATION**

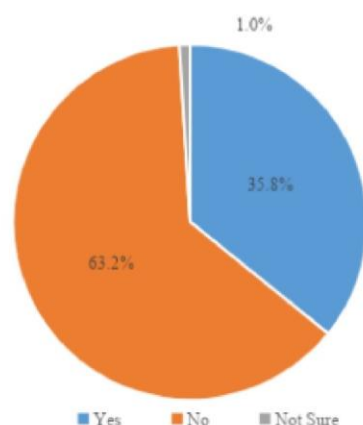
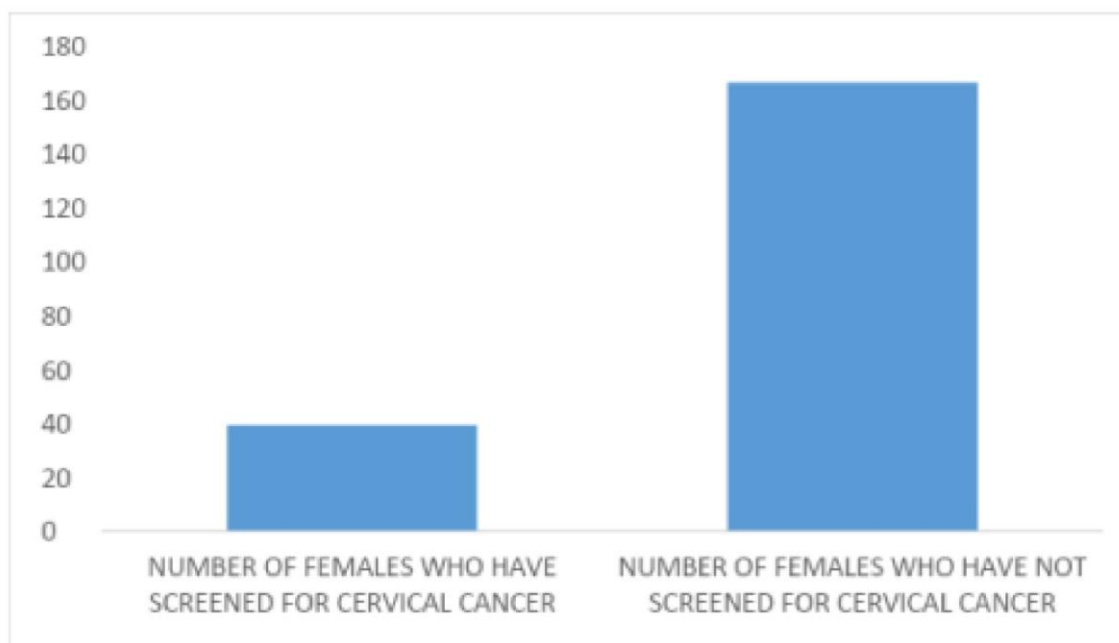


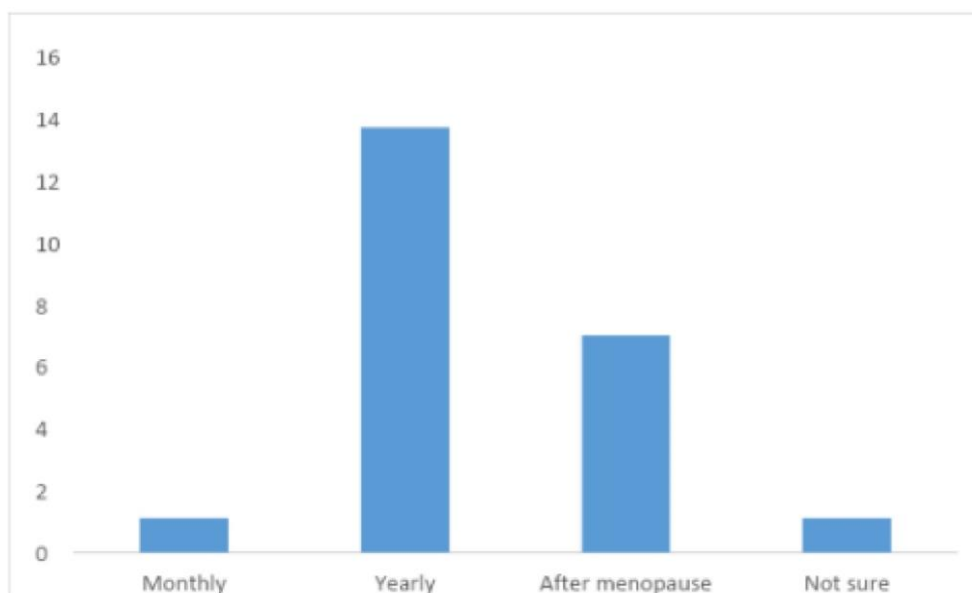
Figure 4.2 represents the percentages of Awareness of HPV Vaccination among women attending ANC at UNTH, Ituku-Ozalla. Apparently, 63.2% of them are not aware of HPV vaccination, 35.8% of them are aware of HPV vaccination while 1.0% of them are not sure if they have ever heard of it before or not.

**FIGURE 4.3: TOTAL NUMBER OF FEMALES WHO HAVE AND HAVE NOT UNDERGONE THE PAPSMEAR TEST**



The figure above shows the number of female patients who have taking part in the Pap smearscreening for cervical cancer and also those who have not done so. 39 of them have screened for cervical cancer, 181 of them have not screened while the rest of the female patients from the sample size apparently, do not know or are not sure if they have done so before.

**FIGURE 4.4: TOTAL PERCENTAGE OF HOW OFTEN THE FEMALES DO A PAPSMEAR TEST**



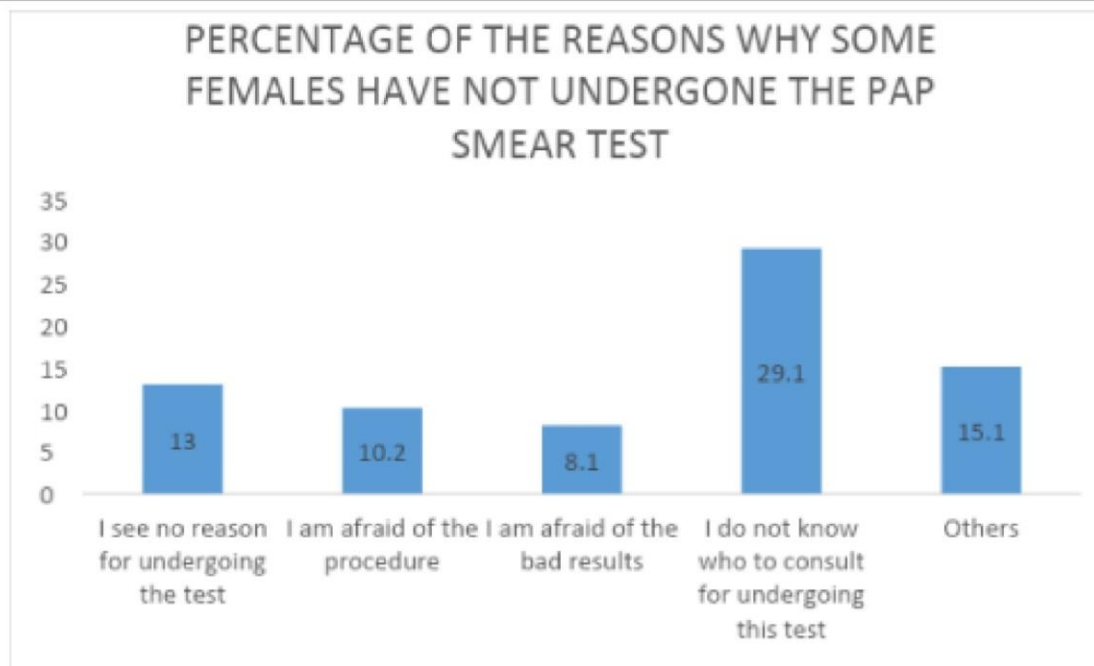
The figure above shows the proportion of how often those who have done the screening for cervical cancer do it. Apparently, most of them (13.7%), do the Pap smear screening yearly followed by after menopause (7%).

**TABLE 4: PERCEIVED BARRIERS TO CERVICAL CANCER SCREENING AND HPV VACCINATION.**  
Where 1=Strongly agree, 2=Agree, 3=Neutral, 4=Disagree, 5=Strongly disagree using Likert scale

Variable	1	2	3	4	5
Any woman including you can acquire cervical cancer	74	109	67	27	8
Screening causes no harm to the client	45	106	114	18	2
Screening for cervical cancer is not expensive.	22	56	177	29	1
Pap smear test is painful	6	23	186	64	6
I don't know where to get a pap smear done	24	83	67	86	25
The hospital is too far	29	52	58	118	27
I prefer a female doctor for the test	73	87	57	55	13
I don't see the need for a pap smear	9	27	101	109	39
It is against my religion	2	9	40	177	57
I always forget to go for the test	11	28	67	140	39
The pap smear test takes a lot of time	13	12	176	63	21
If screening is free and causes no harm, I will screen	128	99	45	11	2
More women need to be informed about cervical cancer screening.	151	80	51	2	1
HPV vaccine is safe	62	59	158	6	0
All women should be vaccinated against HPV	101	104	73	7	0
The vaccine is expensive	16	36	205	22	6
I would prefer if the vaccine is free	177	73	30	3	2
I would like to know more about HPV vaccination	188	69	23	4	1

Table 4 shows the perceived barriers to cervical cancer screening and HPV vaccine among the females attending ANC in UNTH. Most of them agree that they can acquire cervical cancer as women (38.2%), most of them were neutral about whether the screening test causes any harm to the client, is not expensive and pap smear is painful (40%, 62.1% and 65.3% respectively). Majority of them disagree that the hospital for the test is too far (41.4%). Majority of them, also preferred female doctors for the test (30%), and also disagree that the test was against their religion (62.1%). Majority of them also strongly agree that if the screening is free and causes no harm, they will screen, more women need to be informed about cervical cancer screening and that they will like to know more about HPV vaccination i.e., 44.9%, 53.0% and 66.0% respectively. Most of them also agree that all women should be vaccinated against HPV (36.5%).

#### FIGURE 4.5: REASONS FOR NOT HAVING UNDERGONE PAPSMEAR TEST



The figure above shows the percentage of reasons some of the females have not undergone the Pap smear cervical cancer screening test. Apparently, most of them do not know who to consult for undergoing the test (29.1%). Some of the females gave other reasons (15.1%) while some of them do not see any reason for undergoing the Pap smear test (13%).

**TABLE 6: THE ASSOCIATION BETWEEN AGE AND KNOWLEDGE OF CERVICAL CANCER**

	Knowledge about cervical cancer		Sig value
Independent variable			
Age	Yes	157	0.740
	No	116	
	I don't know	12	

The table above shows the association of the age of the female patients and their knowledge of cervical cancer. From the table, we can deduce that since the significant value gotten from the regression (0.740) is greater than 0.05, then there is no positive relationship between the age of the patients and their knowledge of cervical cancer. In other words, their ages do not really correlate with how well they are acquainted with cervical

**TABLE 7: THE ASSOCIATION BETWEEN THE EDUCATIONAL ATTAINMENT OF THE RESPONDENTS AND THEIR KNOWLEDGE OF CERVICAL CANCER**

	Knowledge of cervical cancer		Sig. value
Independent Variable			
Educational Attainment	Yes	157	0.000
	No	116	
	I don't know	12	

The table above shows the association between the educational attainment of the patients and their knowledge of cervical cancer. From this table we can deduce that there is a very strong/positive relationship between their level of education and how well they are acquainted with cervical cancer. In other words, their level of acquaintance with cervical cancer is greatly influenced by their educational attainment.

**TABLE 8: THE ASSOCIATION BETWEEN THE AGE OF THE RESPONDENTS AND THEIR PERCEPTION OF HARM FROM CERVICAL CANCER SCREENING**

	Perception of harm from cervical cancer screening		Sig. value
<b>Independent variable</b>			
Age	Strongly agree	45	0.158
	Agree	106	
	Neutral	114	
	Disagree	18	
	Strongly disagree	2	

The table above shows the association between the age of the patients and their perception of harm from cervical cancer. From the table, we can deduce that there is no positive relationship or association between the age of the patients and their perception of harm from cervical cancer because the significant value gotten from the regression (0.158) is greater than 0.05. In other words, their age and their perception of harm from cervical cancer screening do not have an association.

**TABLE 9: THE ASSOCIATION BETWEEN THE EDUCATIONAL ATTAINMENT OF THE PATIENTS AND THEIR PERCEPTION OF HARM FROM CERVICAL CANCER SCREENING.**

	Perception of harm from cervical cancer screening		Sig. value
<b>Independent Variable</b>			
Educational Attainment	Strongly agree	45	0.000
	Agree	106	
	Neutral	114	
	Disagree	18	
	Strongly disagree	2	

The table above shows the association of the educational attainment of the female patients at UNTH with their perception of harm from cervical cancer. From the table, we can deduce that there is a very strong/positive relationship between their educational attainment and their perception of harm from cervical cancer screening i.e., their level of education affects their perception of harm from cervical cancer screening greatly.

## DISCUSSION

### KNOWLEDGE AND PERCEPTION OF RISK TO CERVICAL CANCER

This study was carried out in the University of Nigeria Teaching Hospital (UNTH), Ituku-Ozalla among pregnant women attending ante-natal clinic with the aim of assessing the level of awareness

and knowledge of cervical cancer, its screening and vaccination and the perception of risk among them.

Out of the 285 pregnant women sampled, majority of them (54.7%) were between the ages of 21 and 30 years, followed by those aged between 31 and 40 years (38.5%). Most of the women assessed were degree holders (38.9%) and the monthly salary of most of

them was in the range of N5,000 – N50,000.

The results of our study show that majority of the women studied have heard about cervical cancer (55.1%). This shows a reasonable level of awareness of cervical cancer among pregnant women attending antenatal clinic in UNTH. This is similar to the study done among female university students in Northern Nigeria which showed an awareness of 53.9%.<sup>45</sup> This finding is also similar to the finding in the study done on postnatal clinic attendees and other non-pregnant women in UNTH, Enugu where it was found that majority of them which is about 44% of the postnatal clinic attendees were aware of Pap smear and 47.7% of the other non-pregnant women were aware of Pap smear.<sup>48</sup> This high awareness can be related to the educational status of women in the South East as similarly high level of cervical cancer knowledge was shown in university students in Northern Nigeria. Majority of the women in this study were educated up to the tertiary level (64.2%).

Indeed, the knowledge of cervical cancer was shown to have a strong association with the educational attainment of pregnant women as shown in the regression analysis ( $p < 0.005$ ). The higher the educational status of the patient, the higher the likelihood of her being aware of cervical cancer. This was similar to the finding in the study done among female university students in Northern Nigeria which showed that 53.9% of them had heard about cervical cancer in the past.<sup>45</sup> Meanwhile, the age and marital status of the patients did not show any strong correlation with their knowledge and awareness of cervical cancer.

In this study, the perception of risk of cervical cancer was shown to be low as majority of the respondents (64.9%) are unaware of the human papillomavirus (HPV) that causes cervical cancer. In a similar manner, the majority of them do not know that multiple sexual partners (51.2%), early age at first sexual intercourse (63.2%), cigarette smoking (67%) and early age at marriage (63.9%) can predispose an individual to cervical cancer. Also, many of them also do not know that oral contraceptive pills (71.2%) and HIV (60.4%) can expose an individual to cervical cancer. This shows a low perception of risk towards cervical cancer. This is similar to findings from the study done among women attending antenatal clinics in tertiary hospitals in Enugu which showed that only 8.1% of the women knew that human papillomavirus caused cervical cancer.<sup>49</sup>

From our study, few of the women had had a history of cervical cancer (16.8%) and about 33% of the respondents have had a first degree relative with a history of cervical cancer. Those who responded positive to having a history of cervical cancer could be referring to cervical premalignant lesions as that distinction was not made in the study.

Overall, women attending antenatal clinic in UNTH showed a good level of awareness of cervical cancer (55.1%) while they also displayed a reduced level of perception of risk as majority (64.9%) do not even know that cervical cancer is caused by the human papillomavirus.

#### UPTAKE OF HPV VACCINATION AND CERVICAL CANCER SCREENING

From the results of our study, most of the respondents (43.5%) do not know about cervical screening and majority of them (49.8%) do not know if it is a useful tool in the early detection of cervical cancer. Majority of the respondents (63.5%) have not undergone a pap smear in the past. This shows a low prevalence of cervical cancer screening among pregnant women attending antenatal clinic in UNTH. This is similar to a study done on Christian women in three towns in Enugu which showed that only 15.5% of the respondents were aware of the availability of cervical screening services and only 4.2% had ever done a Pap smear.<sup>47</sup> It is also similar to the study done among women attending antenatal clinics in tertiary hospitals in Enugu which showed that only 39.5% of the women could identify Pap smear as the screening tests for cervical cancer while only 2.8% had carried out the test in the past.<sup>49</sup> Another study among women in South East Nigeria, Enugu showed a slight increase in the level of awareness of cervical cancer screening while only 19% had been previously screened.<sup>50</sup> The low prevalence and even lower uptake of cervical cancer screening can be attributed to various factors which will be explored further in the subsequent section.

This study also found that most of the women attending antenatal clinic in UNTH (63.2%) do not know if HPV can be vaccinated against and 69.8% of the respondents are not vaccinated against HPV. This shows a low prevalence and awareness of HPV vaccination. Majority of them (70.5%) are not sure if there is need for pap smear screening after HPV vaccination and 35.1% of them think the best time to take the vaccine is between the ages of 9 and 13 years.

#### DETERMINANTS AND BARRIERS TO HPV VACCINATION AND CERVICAL CANCER SCREENING

Barriers to cervical cancer screening include perception of risk, perception of harm due to screening, cost of screening, availability of screening services and level of accessibility, religious influences, preference for female screeners and forgetfulness.

The results of our study show that majority of the women (38.2%) agree that they can acquire cervical cancer as women. Most of the respondents were found to be neutral about whether the screening causes harm to the client (40%), whether the screening is expensive (62.1%) and whether the screening is painful (65.3%). Majority of them (30%) preferred female doctors for the test. Majority of them disagreed that the hospital for the test is too far (41.4%) and that the test was against their religion (62.1%). Majority of the respondents strongly agreed that if the test was free and causes no harm, they will screen (44.9%), that more women need to be informed about cervical cancer screening (53.0%) and that they will like to know more about HPV vaccination (66.0%). Most of them also agree that all women should be vaccinated against HPV (36.5%). This shows similarity to the study done across 20 local government areas in Ogun state which indicates lack of awareness as the major barrier to uptake of cervical cancer screening as depicted by the response of 90.5% of respondents.<sup>64</sup> Also, another study done in Nnamdi Azikiwe University Teaching Hospital, Awka, Anambra State has

shown similar results in that majority of respondents listed obstacles to uptake of cervical cancer screening as conflicting health beliefs, cultural taboos, interference with sexual relationship and denial driven by fear of cancer.<sup>7</sup>

From our study, the commonest observed barrier to cervical cancer screening uptake despite awareness is the cost and safety as majority (44.9%) agrees that they would screen if the test was free and causes no harm.

The perceived barriers to the uptake of HPV vaccination were also identified as lack of awareness and the cost of vaccination as majority (66.0%) strongly agreed that they would like to know more about the vaccination and they would prefer if the vaccine was free (62.1%).

We also found a strong correlation between the perception of harm by the cervical cancer screening test and the educational attainment of the woman ( $p < 0.005$ ). Therefore, from the study, the educational attainment of the woman positively affects whether they consider the screening test to be safe or harmful which could constitute a serious barrier to cervical cancer screening uptake.

#### LIMITATIONS OF STUDY

The major difficulty we had was getting respondents for our study as the number of women who come for antenatal clinic in UNTH daily were low probably due to the distance of the teaching hospital from the urban Enugu city. We tried to get approval to study more women from an additional hospital in Enugu city but we had serious difficulties getting the ethical approval. We eventually met our target sample size here in UNTH but it took more time than we estimated for the data collection.

#### CONCLUSION

In conclusion, this research was carried out to assess the knowledge and perception of the risk to cervical cancer and barriers to cervical cancer screening and HPV vaccination among 285 women attending antenatal care in UNTH, Ituku-Ozalla. The study showed that the pregnant women had a good level of awareness of cervical cancer (55.1%) but they also displayed a reduced level of perception of risk as majority (64.9%) didn't know that cervical cancer is caused by the human papillomavirus (HPV) and were not aware of the various predisposing factors to cervical cancer (51.2-71.2%).

Also, from this study, we discovered that a good number of them (41.8%) had not heard about cervical screening (Pap smear test) and only few (13.7%) had undergone pap smear test in the past thus, indicating a low awareness rate of pap smear test and an even lower prevalence rate of the screening. The most prevalent reason for not screening was that they didn't know whom to consult (29.1%). There was a low awareness and prevalence rate of HPV vaccination as 63.2% were not aware of it and 69.8% had not been vaccinated.

In addition, the commonest observed barrier to cervical cancer screening uptake despite awareness was the cost and safety of the screening as majority (44.9%) agreed that they would screen if the test was free and causes no harm. The perceived barriers to the uptake of HPV vaccination were also identified as lack of

awareness and the cost of vaccination as majority (66.0%) strongly agreed that they would like to know more about the vaccination and they would prefer if the vaccine was free (62.1%).

#### RECOMMENDATIONS

In line with the findings of our study, we make the following recommendations;

- Health education to enlighten women especially uneducated women on Cervical cancer screening and its importance in the prevention of cervical cancer. Health educators and health care workers should utilize every opportunity with women to educate them on taking preventive health actions like screening services for prevention of cervical cancer. Health education also among women, especially in any women gathering such as churches, meetings, hospital, and so on, to increase awareness of the HPV vaccines and the importance of being vaccinated early. Children between the ages of 9 and 13 years old should be the target for vaccination prior to sexual exposure. Enlightening parents about vaccination is very important as at these ages, parents are the ones to make decisions for their children.
- Government should make HPV vaccines free if possible or at least subsidize the price of the vaccine for women especially for low-income earners to encourage increased uptake.
- Government should provide free Cervical cancer screening services to encourage participation.
- Increased public awareness on Cervical cancer, its screening and vaccination through the various mass media outlets.
- The management of University of Nigeria Teaching Hospital, Ituku-Ozalla, should also endeavour to make the cervical screening tests and HPV vaccines readily available for women (both patients and health workers) and at affordable rates.
- At the legislative level, the policy makers can help by making and implementing policies that encourage cervical cancer screening and HPV vaccination such as including the HPV vaccine in the NPI schedule for female children between the ages of 9 to 13 years.

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# Cervical Cancer As A Sexually Transmitted Disease: Implications And Applications

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**Keywords:**

*Cervical cancer, Human papillomavirus, Human papilloma vaccine, HPV screening*

**Introduction**

Sexually transmitted disease (STD) is a condition that results from a sexually transmitted infection (STI).(1) The latter can be viruses, bacteria, or fungi which are usually transmitted through an exchange of bodily fluids or skin-to-skin contact during sexual activities. Furthermore, cervical cancer is a malignant disease of the lower one-third of the uterus in the woman (figure 1) caused by oncogenic human papillomavirus (an STI);(2) so, it can be referred to as an STD.

Cervical cancer is a public health concern with a global burden of over 600,000 new cases and 340,000 deaths per year. Unfortunately, 90% of these preventable cervical cancer deaths occur in low-and-middle-income countries (LMICs), especially in Sub-Saharan Africa.(3)Figure 2 shows the comparative high magnitude of cervical cancer incidence and deaths in Sub-Saharan Africa.(3)In Enugu, Nigeria, it is the most commonfemale genital tract malignancy, contributing to 66% of all genital tract cancer patients admitted to the University of Nigeria Teaching Hospital Ituku-Ozalla.(4)

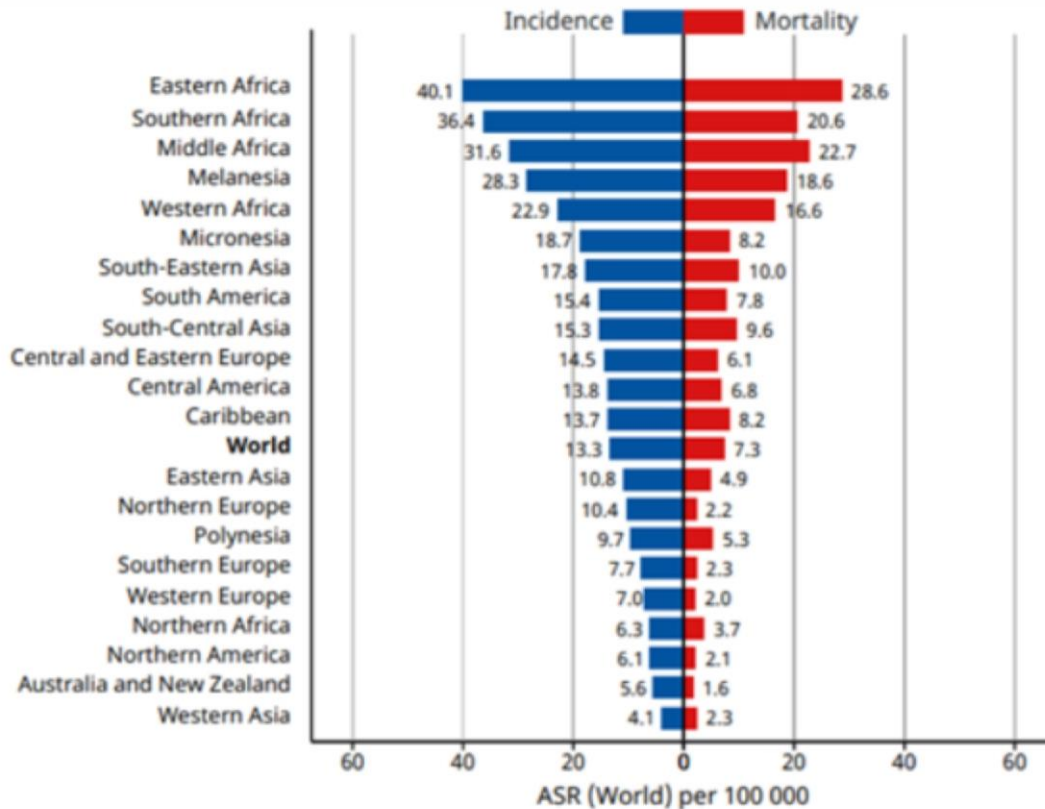


Figure 1: Age standardized Global incidence and mortality rates of cervical cancer

The natural course of cervical cancer (fig. 2) presents a “friendly” opportunity for its prevention and cure when identified early. The disease has the pre-malignant stage (CINI-3), Early-stage cancer ( $\leq$  stage 2a), and Late-stage cancer ( $\geq$  stage 2b). The pre-malignant stage can be identified through the available screening methods (HPV screening, Pap test, or Visual inspection with acetic acid) and cured. Likewise, early-stage cancer is curable either through radical surgery or radiotherapy. Unfortunately, most patients present in the late stage of the disease in our environment when a cure is no longer possible. A single center review of cervical cancer patients from Jos, Nigeria found that 72% of the women presented with a late-stage disease with an all-cause mortality rate of 79.8 per 100 womenyears.(5) Likewise, a recent meta-analysis of 53,233 participants from 25 studies from three world regions showed a global and African prevalence of late-stage cervical cancer presentation of 61% and 63% respectively.(6)

The late presentation of cervical cancer has been attributed to the prevailing poor knowledge and uptake of the disease preventive services including screening;(7) others include poor health-seeking behaviour, health system delay,(8) and “Not-my-portion” syndrome.(9) A typical example of the latter is the finding from a survey of women medical doctors in Enugu which suggests that the awareness of cervical cancer in our environment does not translate to improved uptake of the screening among women – the survey found that all respondents were aware of cervical cancer and its screening method (Pap smear) but only 18% of them had ever screened for the disease.(10)

#### Implications of cervical cancer as a sexually transmitted disease

Cervical cancer is caused by persistent infection with high-risk (oncogenic) HPVs. The human papillomavirus is a group of epitheliotrophic double-stranded DNA viruses – there are over 200 types that are numbered according to the molecular similarity of their genetic material and order of discovery.(11, 12) About 40 types are sexually transmitted by skin-to-skin contact likely through a breach on the skin/mucosal surface, and the spread of the virus to adjacent host cells is believed to be by autoinoculation. Sexually transmitted HPV is further classified into three groups based on the risk of causing cervical cancer: High risk (HR) 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68, 73, 82; Probable high-risk (pHR) 26, 53, 66, 67, 84, 90, 91; Low risk (LR) 6, 11, 34, 40, 42, 43, 44, 61, 70, 72, 81, 89.(11)

Papillomaviruses are species-specific, and site-specific (with overlaps), and the only known reservoir is humans.(13) Generally, they have three functional genome regions thus:

- i. The early (E) region codes for 6 non-structural genes, several of which are associated with cellular transformation.
- ii. The late (L) region codes for 2 structural proteins, L1 and

L2, that form the capsid

- iii. The long control region is a noncoding region that regulates replication and gene function

The HPV replicates in the nucleus of the host only, where it can form a separate episomal DNA if the infecting type is low-risk or integrate with the host's DNA if the infecting type is high-risk.(13) The latter is a sign of malignant transformation because the HR-HPV uses its E6 and E7 proteins to inactivate the host's tumour suppressor proteins p53 and Rb.(13)

Thus, in the human cervix, the HPV infects the basal cells of stratified squamous epithelium and metaplastic cells of the transformation zone, leading to either of the following:

- a) An asymptomatic infection
- b) Clinical manifestations of genital warts if low-risk HPVs such as types 6 and 11
- c) Cervical diseases (squamous intraepithelial lesions and cancer) when there is persistent infection with high-risk HPVs especially types 16 and 18

Nevertheless, infection with oncogenic HPVs alone may not lead to malignant transformation of the cervical epithelia - cofactors are often necessary to catalyse the malignant transformation. These cofactors include immunocompromise status such as HIV infection, tobacco use, coinfection with other sexually transmitted agents such as those that cause herpes simplex and chlamydia, long use of oral contraceptives, and family history of cervical cancer.(13) It is also known that there is a direct correlation between anogenital HPV infection and sexual activity measures such as the age of first coitus, and the lifetime number of sexual partners. However, the peak age for HPV infection is a few years after the first coital experience while the prevalence reduces in older age because most individuals can clear the genital HPV infections without symptoms within 18 months.(12) The genital HPV clearance capacity contributes to the reason cervical cancer screening is not recommended for adolescents and young adult women. On the other hand, genital HPV infection can persist and such infections are likely to be associated with cervical pre-malignant and malignant lesions.(12) Thus, the need for a cofactor and the capacity of an immune-competent person to clear the HPV infection, support the fact that cervical cancer is a rare consequence of HPV infection which takes several years to manifest;figure 2 below demonstrates the natural history of cervical cancer. Cervical cancer is entirely HPV attributable but, the attribution to various types of HPVs varies worldwide with HPV types 16 and 18 contributing about 70% of all cases. In Nigeria, about 53% and 15% of cervical cancers are caused by HPV types 16 and 18 respectively.(15) Figure 3 shows the top ten HPV types attributable to cervical cancer in Nigeria.(15)

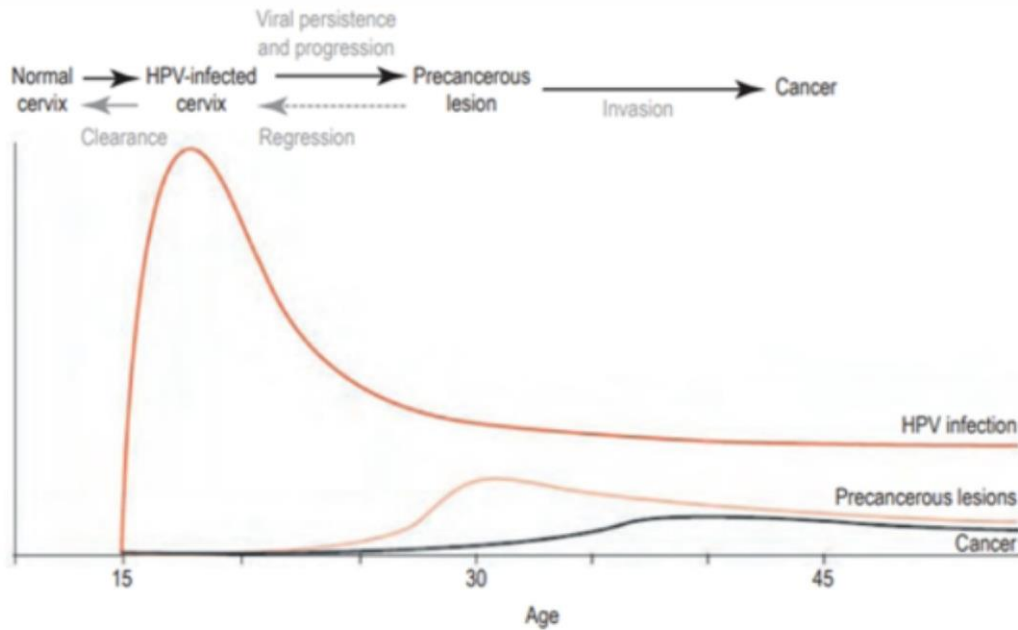


Figure 2: The natural history of HPV and its relationship with cervical pre-cancer and cancer (14)



Figure 3: Top ten HPV types attributable to cervical cancer in Nigeria

**Application of cervical cancer as a sexually transmitted disease**

It has been established that cervical cancer is caused by oncogenic HPVs therefore prevention of transmission of the virus among humans is at the core of the primary and secondary prevention of cervical cancer. Primary prevention of cervical cancer aims at preventing the disease from occurring by limiting risk exposure including lifestyles such as abstinence, and HPV vaccination; while secondary prevention targets the early detection and treatment of the pre-cancerous lesion via HPV DNA testing. Unfortunately, the use of a condom does not completely prevent the transmission of genital HPVs.

Regarding HPV vaccination, it is recommended for pre-adolescent girls (9 – 14 years) with any approved and accessible HPV vaccine which should contain HPV types 16 and 18. In some countries, routine vaccination has been extended to boys. The three known HPV vaccine brands in use currently are - the noncovalent HPV vaccine (Gardasil 9) which targets HPV types 6, 11, 16, 18, 31, 33,

45, 52, and 58; quadrivalent HPV vaccine (Gardasil) targets HPV types 6, 11, 16 and 18; and bivalent HPV vaccine (Cervarix) which targets HPV types 16 and 18. Notably, HPV types 6 and 11 are low-risk HPV types that prevent genital warts (Condyloma acuminata).(16) The current recommendation is two doses of the vaccine at least six months apart.

It is established that HPV vaccination is effective for the prevention of cervical cancer. For instance, a 2021 audit report of the early effect of routine bivalent HPV immunization programme on cervical cancer and pre-cancer registrations in the United Kingdom, concluded that “the HPV immunisation programme has successfully almost eliminated cervical cancer in women born since Sept 1, 1995”.(17)

Furthermore, HPV screening is a molecular diagnostic test for HR-HPV and is considered a high-performance screening for cervical pre-malignant diseases, superior to cervical cytology and visual inspection with acetic acid (VIA). The recommended start year

among women by the World Health Organization is 30 years for the general population (repeat every 5-10 years), and 25 years for women living with HIV (repeat every 3-5 years).(18)

Because of the effectiveness of HPV vaccination and HPV screening of reproductive-age women, both interventions are part of the strategy launched by the WHO in November 2020 for the global elimination of cervical cancer as a public health disease.(19) The strategy has three targets that should be achieved by all nations by 2030 and sustained afterward, to achieve the global elimination goal by the end of the century. Though member nations are making progress toward achieving the targets, there is a need to accelerate the implementation of the strategy, especially in Africa which has the highest burden of cervical cancer.

### Conclusion

Cervical cancer is a common female genital cancer caused by persistent infection with HR-HPV especially types 16 and 18. Since HR-HPVs are sexually transmitted infections, cervical cancer can therefore be described as a sexually transmitted disease. Finally, the association of cervical cancer with HPV is currently utilized in the ongoing global effort at eliminating the disease, through HPV immunization and HPV screening.

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# Monkeypox And Sexual Health

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## **Keywords:**

*Cervical cancer, Human papillomavirus, Human papilloma vaccine, HPV screening*

## **INTRODUCTION**

After over a decade from the discovery of Monkeypox virus among infected Monkeys at Copenhagen, Denmark in 1958, there was still no record of any human case infection (1). This contributed to the misnomer "Monkeypox" despite the virus' ability to infect other animal hosts, especially rodents and non-human mammals (2). But before smallpox was declared eradicated, the first human case was recorded in the Democratic Republic of Congo(DRC) in a 9-month old baby in 1970(2). From then on, several cases of Human Monkeypox were discovered in tropical areas of Central and West Africa (2). But these cases remained endemic in Africa until 2003, when over 47 cases were recorded in the United States (3). However, the highest recorded cases of Monkeypox was in Nigeria in 2017, where there were over 500 suspected cases and 200 confirmed cases (2).

Human Monkeypox is a zoonotic virus from the family Poxviridae, subfamily Chordopoxvirinae and Genus Orthopoxvirus. It was later divided into the West Africa Clade and the Central Africa (Congo Basin) Clade which is more virulent (4). In comparison to smallpox, monkeypox is less contagious but can also be transferred from animal-to-human, human-to-human and even mother-to-fetus through the placenta (2). But transmission is majorly through contact with infected bodily fluids, skin lesions and infected environment (including nosocomial infection).

Monkeypox is a self-limiting disease with an incubation period of 5-21 days followed by the prodromal period of illness with symptoms of fever, severe headache, muscle pain, asthenia and lymphadenopathy (distinguishing feature from smallpox) (2). After this period, skin eruptions begin to appear. These rashes usually appear on the face and extremities as well as the genitalia, mucosal membranes, conjunctiva and cornea; progressing from macules, papules, vesicles, pustules and finally crusts (6).

However, despite the approval of the attenuated vaccinia virus in 2019 and its treatment with antiviral agents like tecovirimat; there's still the lack of clinical management guidelines and available vaccines (2,7). It was discovered that people vaccinated in the last

four decades against smallpox show lower susceptibility to Monkeypox but unfortunately, routine vaccination against smallpox has significantly declined since it was declared eradicated. Thus, endemic and non-endemic regions are now even more susceptible to Monkeypox especially for people below the 40-50 years' age group, and with underlying health issues (4).

Therefore, it is important to understudy the relationship of monkeypox and sexual health in order to understand how they both interplay to affect overall health, given the fact that the disease in question has been declared a disease of public health concern, which is the overall health of this paper.

## **SEXUAL TRANSMISSION OF MONKEYPOX**

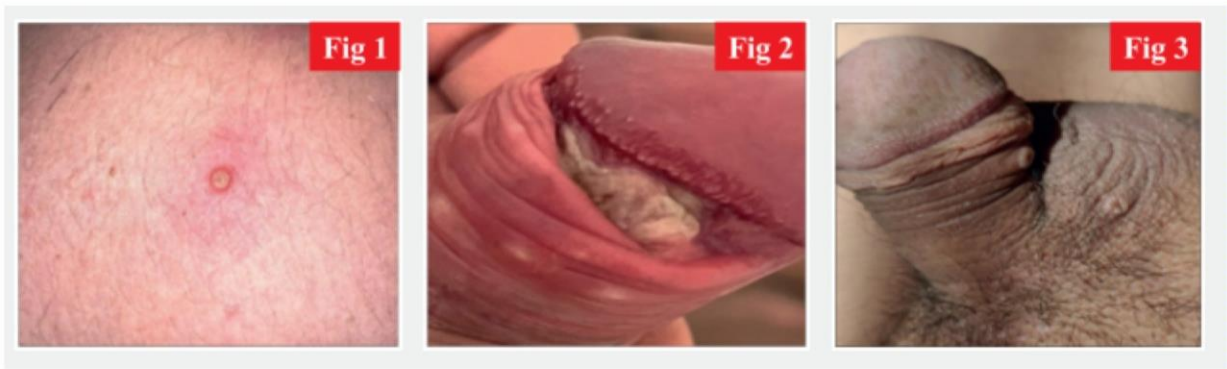
So many possible routes of transmission have been posited. However, there have been speculations that the sexual transmission of Monkeypox is possible, ever since several cases were recorded among men sleeping with men (5). At this time, MPX denotes the most recent emerging zoonotic disease worldwide [8]. For this reason, it is important to have knowledge of the clinical characteristics, sexual behavior to aid in the correct management of these patients.

It has been found that the majority of patients are men who have sex with men (MSM) or gay or bisexual as their sexual behavior are at high risk of contracting MPX virus with an average age of 36 years. Most of the patients may have a coexisting sexually transmitted infection (STI) such as Herpes virus, Gonorrhoea and syphilis with a high prevalence of HIV positive patients (8,9,10, 16-18).

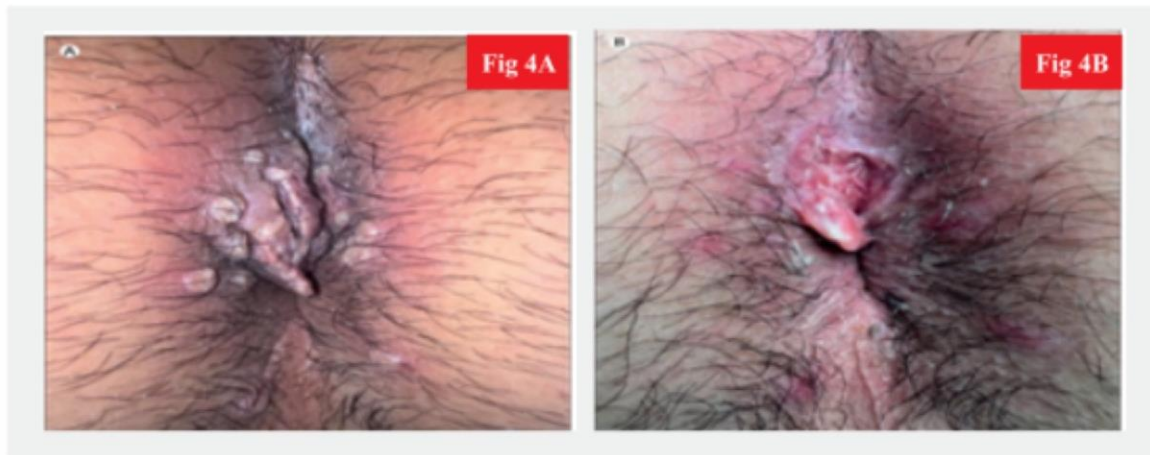
## **CLINICAL MANIFESTATION AFTER TRANSMISSION**

The most frequent clinical manifestations that have been observed in patients confirmed with monkeypox were fever, headache, painful perianal and genital lesions.

The average number of days from systemic symptoms to the appearance of lesions were 3. The most frequent sites of lesions



**Figure 1.** Single umbilicated pustular lesion on leg; **Figure 2.** Multiple coalescing lesions on penile sulcus and multiple non-coalescing lesions on penile shaft; **Figure 3.** Multiple umbilicated pustular lesions on the penile shaft



**Figure 4.** Multiple ulcerative lesions on perianal skin (A) progressing into a large coalescing ulcerative lesion (B) (Pictures taken 10 days apart.)

were perianal, genital, oral, trunk and upper and lower extremities (8-18).

### The Role Of The Clinician

The clinician needs to be aware of these new developments as he attends to his patients as this will aid in mitigating the spread. This is needed as the spread through sexual contact is not yet well known and popularized. Therefore, clinicians need to obtain a very good history and examination with a good background knowledge on the presentations and pathological features of the disease as they present.

Thus, a good awareness needs to be made by clinicians amongst the young populace on the prevention of these disease as they seem to be the prevalent population affected by the disease. Furthermore, the clinicians need to protect themselves adequately and maintain adequate hygiene of the hospital environment to not be means of propagating the disease among their patients.

### Conclusion

The reemerging of monkeypox has spread quickly all over the world and has shown uncommon accounts of person-to-person spread

through possible sexual contact. The prevalence of STIs and the site of lesions point to local inoculation during intimate skin-to-skin or mucosal contact during sexual activity. Men who have sex with men have been shown to be people who are most at risk of spreading monkeypox, given that MPXV DNA can be found in seminal fluid. Good history and examination with an adequate knowledge on the symptoms and presentation of the disease is crucial in diagnosis and treatment. Meanwhile, adequate awareness need to be increased amongst the populace, especially the LGBTQ community who are the population at risk, to help in the prevention of the disease.

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# Female Genital Mutilation; Myths, Facts And Abolishment.

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## Overview:

Female genital mutilation (FGM) is also known as Female circumcision or female cutting, in Igbo land it is called “IbiNwaanyiugwu”. According to the World Health Organization, FGM comprises of all procedures involving partial or total removal of the female external genitalia or other injuries to the female genital organs for non-medical reasons.

This barbaric practice has no health benefit and harms women and girls in many ways. It involves removing and damaging healthy and normal female genital tissue and hence interferes with the natural function of girls' and women's body. FGM is usually done on girls between infancy and 15years, it is a form of child abuse and sexual assault.

## Epidemiology of FGM in Nigeria.

Nigeria has one of the highest absolute number of cases in the world, accounting for about one -quarter of the estimated 115-300 million circumcised women worldwide. **25 per cent of women and girls, aged 15-49, have undergone some form of FGM in Nigeria.** Although there is a progressive decline in FGM in young age groups, but it is still practiced in places where they are deeply rooted in local traditions.

In Nigeria, research has revealed that FGM has the highest prevalence in the south-south (77% amongst adult women, followed by southeast (68%), and southwest (65%), but practiced on a smaller scale in the north.

## Types:

FGM has been classified by the World Health Organization into 4 types:

**Type 1- Clitoridectomy:** This is the partial or total excision of the clitoris (a small, sensitive and erectile part of the female genitals) or the fold of skin surrounding it.

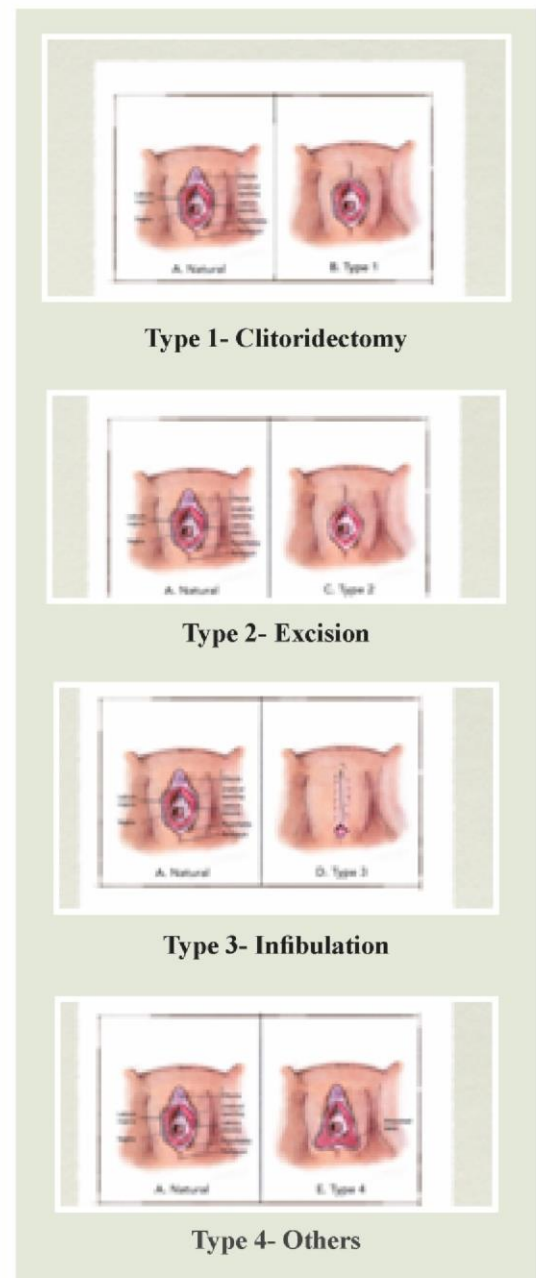
**Type 2- Excision:** Partial or total removal of the clitoris and labia minora, with or without excision of the labia majora (labia are the lips surrounding the vagina).

**Type 3- Infibulation:** This is the narrowing of the vaginal opening through the creation of a covering seal. The seal is created by cutting and repositioning the inner or outer labia, with or without removal of the clitoris.

**Type 4- Others:** This includes all other harmful procedures to the female genitalia for non-medical purposes. Examples: piercing, incising, pulling, stretching, scraping and cauterizing the genital area.

## Health Risks and Consequences.

This is grouped into: Immediate/ Short term complications and Long term complications.



**Immediate/short term complications:**

- 1) Severe pains.
- 2) Emotional and psychological shock.
- 3) Bleeding.
- 4) Wound infections including blood-borne viruses (HIV & Hepatitis B or C) and tetanus. This can occur due to using instruments that aren't sterile or clean.
- 5) Urinary retention, Urinary tract infection and pains while urinating.
- 6) Injury to adjacent tissues.
- 7) Fracture or dislocation as result of restraint.
- 8) Damage to other organs.
- 9) Death.

**Long term complications:**

The longer-term implications for women who have been subjected to FGM type 1 and 2 are likely to be related to the trauma of the actual procedure.

- 1) Chronic Vaginal and pelvic infections.
- 2) Difficulties with menstruation.
- 3) Difficulties with passing urine and chronic urine infections.
- 4) Renal impairment and renal failure.
- 5) Damage to the reproductive system, including infertility.
- 6) Infibulation cysts, neuromas and keloid scar formation.
- 7) Complications in pregnancy and delay in the second stage of labor.
- 8) Pain during sexual intercourse and lack of pleasurable sensation.
- 9) Psychological damage, including a number of mental health and psychosexual problems such as: low libido, depression, anxiety, and sexual dysfunction, flashbacks during pregnancy and childbirth, self-harm.
- 10) Death during child birth.

**Why is it Practiced?**

There are certain fallacious excuses for the practice of FGM by families and communities.

The United Nations Populations Fund (UNFPA) has classified the reasons into 5 categories:

1. Psycho-sexual: To control a woman's sexuality. Certain communities perceive intact women to be dishonorable prostitutes, some claim that men will refuse to marry intact women.
2. Sociocultural: Here, FGM is seen as part of a girl's initiation to womanhood and an intrinsic part of a community's cultural heritage.
3. Hygiene & Aesthetics: This reason is for those communities that consider the female external genitalia as ugly and dirty.
4. Religious: "supposed" religious doctrines may be used to justify the practice.
5. Socioeconomic: In some communities, FGM is a pre-requisite for marriage especially where women are entirely dependent on men economically.

**Myths and Facts about Female Genital Mutilation.**

**Myth:** If you have FGM, you are clean and eliminates the chance of any smell from that part of the body.

**Fact:** The body is designed to ensure that a woman can pass urine, menstruate, have intercourse and deliver a baby. If the opening is narrowed or closed, there is a high risk of infection as the body cannot get rid of urine and blood effectively. This can back up and cause infections which will cause the woman/girl to smell.

**Myth:** if you are a good Muslim, you should undergo the procedure.

**Fact:** FGM is not a religious Practice but people think it is.

**Myth:** if you are cut, it usually heals up quickly.

**Fact:** The cut can sometimes take up to 7 weeks to heal and sometimes it gets infected and never heals properly. The cutting can cause infections and bleeding and can severely damage the girl's health, cause long term problems and even death.

**Myth:** If the clitoris is not cut, it will continue to grow.

**Fact:** The clitoris stops growing after puberty and is still small at the final stage of growth.

**Myth:** If the clitoris is not cut, it will harm the baby during delivery.

**Fact:** The clitoris causes NO harm to the fetus, the child or mother, whereas, FGM may cause serious complications during childbirth.

**Myth:** People from other communities should not get involved. FGM has nothing to do with them and they don't understand.

**Fact:** Many different people, including teachers, health professionals and the police are working to stop FGM as it can cause long term problems, pain and distress for those who have done it.

**Myth:** it's not that common — at least, not anymore.

Based on data collected by the UN, 98% of women and girls between the ages of 15 and 49 in Somalia have been cut. Sierra Leone, Egypt, Eritrea, and Djibouti all have rates above 90%. Egypt alone is home to the largest number of FGM victims in the world (nearly a quarter). In many countries, the prevalence of FGM is lower for younger girls than older age groups, meaning some progress is being made; however, in countries like Guinea, Mali, Somalia, and Sudan the difference between age groups is slight, reflecting unchanging practices.

In some places the prevalence of the practice appears to be increasing. The number of girls and women in the US who have undergone FGM has more than tripled since the 90s.

**Myth:** Women who have undergone FGM cannot experience sexual pleasure.

In many of the cultures and communities that support FGM, it is believed that women should not experience sexual pleasure and that FGM keeps girls "pure" by preventing them from enjoying sex — and it often succeeds. Many FGM survivors experience physical pain during intercourse, which discourages them from engaging in

sexual activity. The trauma of cutting may also cause women to abstain. However, sexual pleasure after FGM is not impossible, and many women have reported being able to enjoy sexual activity despite having undergone cutting. This means that the premise of the practice — to reduce or eliminate sexual arousal or enjoyment — is flawed.

#### **Our Role in the abolishment of Female Genital Mutilation.**

- Educate yourself and others: Understand that FGM is not permitted by any religion, it violates fundamental and reproductive rights of women and girls. It is classified as a harmful traditional practice under the 5 types of gender based violence.
- Raise awareness by carrying out seminars on this topic in areas where they are prevalent, stressing on the great dangers of this ugly practice that wreaks havoc to the health of females.
- Include men in the discussion: Everyone needs to be aware that this is abuse rather than tradition.
- Report practitioners to the police.
- At the National level, strict policies and legislation protecting the rights of girls and women to live free from violence and discrimination should be established.
- Change traditions that propagate FGM practice, with the support of traditional rulers and older generations.

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# Racial Disparity In Uterine Fibroid

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Uterine fibroid (leiomyoma) is the most common benign pelvic tumors in women. It is particularly common among blacks and contains smooth muscle cells interlacing with fibrous tissues, arranged in whorled pattern. It is estrogen dependent, thus, it grows only in the reproductive years of life.

The etiology of uterine fibroid remains unknown but there are some genetic and environmental predispositions to it.

## Risk Factors:

- BLACK RACE.
- Low parity or nulliparity
- Obesity
- Hyperestrogenic state.
- Combined oral contraceptive pill usage.

## Protective Factors:

- Multiparity
- Smoking
- GnRH analogue.

Uterine fibroids, are the most common benign gynecologic tumors; ultrasound evidence shows that more than 80% of African American women and approximately 70% of white women will have fibroid by age 50. However, because only 20% to 50% of all women with fibroid experience related symptoms and because screening for fibroid is not routinely performed, the true incidence is difficult to ascertain. Infact, the reported incidence of fibroid in most studies likely is underestimated because they include only symptomatic women with clinical diagnosis confirmed by ultrasound. For women in their 40s and 50s, abnormal uterine bleeding is the most common reasons to seek gynecologic consultation, and fibroids are the most common causes of this symptom. Pelvic pain, another common reason for gynecologic consultation, is a symptom often associated with fibroids.

## Clinical Features Of Uterine Fibroid

- Asymptomatic (about 75% of cases)
- Abdominal swelling (most common)
- Abdominal pain (may be due to red degeneration, infection, torsion etc.)
- Abnormal uterine bleeding (menorrhagia, metrorrhagia)
- Others: dysmenorrhea, dyspareunia, pressure symptoms.

- Indirect but associated symptoms: constipation, infertility, pregnancy wastage.

## Clinical Features Of Uterine Fibroid

### Ways by which uterine fibroid may cause subfertility:

- Blockage of sperm movement
- Due to increased surface area, sperms have to travel a longer distance.
- The associated menorrhagia may reduce coital frequency per cycle.

## Disproportionate Impact Of Fibroid And Biologic Studies Of Racial Differences.

In addition to having greater lifetime incidence of fibroids, African American women have a 3-fold increased age-adjusted incidence rate and 3-fold increased relative risk of fibroids when adjusted for other confounding factors. African ancestry is considered a key risk factor for development of fibroids. African women have fibroids diagnosed at earlier ages (between 29 and 39), are more likely to be symptomatic, and are more likely to have different responses to medical treatment than white women. The size and growth rate of fibroids are greater in African American women, and they are more likely to undergo surgical intervention than other racial groups. Approximately 42 per 1,000 women are hospitalized annually because of fibroids, but African American women have higher rates of hospitalization, myomectomies, and hysterectomies compared with white women.

Some research suggest that the following risk factors plays a role as to why uterine fibroids is more prevalent in blacks than whites:

- A recent study has linked Vitamin D insufficiency with increased fibroid risk in black women. This study is important not only because of biologic plausibility of the mechanism (i.e, darker skin inhibits production of biologically active Vitamin D) but because it opens a potential pathway to prevention. Higher levels of melanin prevent the skin from synthesizing as much Vitamin D from sunlight as possible.
- Some evidence links environmental factors such as diet (obesity) and history increased stress to this increased

risk.

- Genetics has equally been linked to the high prevalence among blacks.
- More frequent use of hair relaxers
- Perceptions about periods  
Heavy periods or menstruation and pelvic pain are common fibroid symptoms. Individuals and healthcare professionals sometimes overlook these symptoms or believe they are a normal part of menstruation. As a result, many women do not seek treatment for fibroids for over 3years.
- Difficulty accessing healthcare centers.

#### Conclusion;

Black women are more likely to experience uterine fibroid, and often suffer not only from the symptoms, but also during treatment. although there is no confirmed cause of this disparity, it would be good to control the elements discussed above if we can.

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# Sexual Appeal: The Benefits And Complications Of Cosmetic Surgery.

Mgbemena Nwabufo

“you boys can keep your virgins, give me hot old women in high heels with asses that forget to get old.” This quote by Charles Bukowski in his classic, *Love is a Dog from Hell*, infers that sexual appeal is an age-long concept, present in every human society. Wikipedia defines sexual appeal, as an individual's ability to attract other people sexually. The contextual meaning and elements of sexual appeal, differed greatly in a lot of cultures and societies up until the late 19<sup>th</sup> and 20<sup>th</sup> century, which was marked by the shifts in attitudes associated with secularization, liberalization and modernization. These modifications have been able to permeate virtually all existing cultures, and alter the meaning of sexual appeal and create a general understanding of the concept by these societies.

Albeit sexual appeal has been described above mostly in an objective manner, sexual appeal is more subjective than objective, concurring with the popular expression, “beauty lies in the eye of the beholder.” An individual can be attracted to a person because of the height, the way he or she sounds, walks, or the person's odor or touch. One can also be attracted to intelligence and other abstract qualities. Thus no matter how neutral we try to make the concept seem, sexual appeal is a function of individual choices, and these choices can be influenced by biological, moral, legal and social choices (media, sexual orientation). Sexual appeal has been employed as a tool by various industries such as the film industry, gaming industry, advertisement companies and modelling companies.

Cosmetic or Aesthetic surgery is a category of plastic surgery, which aims at improving the appearance of a part of the body. This differs from the other major category of plastic surgery which is Reconstructive Surgery which aims to reconstruct a part of the body or improve its functioning. Cosmetic surgery is an elective surgery that is performed on normal or injured parts of the body, to improve the person's appearance. There has been an exponential increase in the amount of cosmetic surgery procedures performed, in the 21<sup>st</sup> century. Cosmetic procedures have actually been practiced for centuries, but the discipline became very popular during recent times.

Some of the popular aesthetic procedures include;

- Abdominoplasty / “tummy tuck”

- Blepharoplasty / eyelid surgery
- Mammoplasty which includes all procedures involving the breasts e.g breast augmentation, reduction mammoplasty, and mastopexy.
- Buttock augmentation
- Cheiloplasty which involves reshaping the lips.
- Rhinoplasty, which involves reshaping the nose.
- Otoplasty, which involves reshaping the ear.
- Rhytidectomy, which involves all procedures associated with the removal of wrinkles and signs of aging from the face
- Genioplasty
- Liposuction

There exist an intrinsic correlation between sexual appeal and cosmetic surgery procedures; people opt for these procedures to improve their physical appearance and enhance their sexual appeal. Also the media, social media, and advertising & modelling companies greatly influence people's choices and have played a role in the increased number of procedures that have been carried out in the 21<sup>st</sup> century. Cosmetic procedures have a gender bias, being more commonly employed by more women than men. There are many reasons why individuals opt for cosmetic surgery. While these reasons are highly subjective, there are some which are fairly common and may include;

- Most individuals opt for cosmetic surgery to enhance their sexual appeal and improve their body image. This is a popular rationale behind the boom in the number of procedures carried out per year. Entertainers in the movie and music industry, are mostly implicated in this, as their occupation suggests such procedures to boost their image popularity. Also, sex workers employ cosmetic procedures to augment their sexual appeal to attract more customers. Popular procedures include; mastopexy, buttock augmentation and genioplasty.

- Another popular reason why people employ cosmetic

procedures is to reverse some of the regressive changes associated with aging. While aging is a natural process, some persons find some of the changes associated with it unappealing and regard it as a threat to their body image. These persons now employ these procedures to reverse these “unwanted changes” on their bodies. Some of the popular procedures include; rhytidectomy, otoplasty, mastopexy and abdominoplasty.

- People opt for cosmetic surgery to correct defects, or improve the appearance of scars on their body. Even though this is mostly the concern of reconstructive surgeons, cosmetic surgery is employed to improve the appearance of these defects. An example of such procedures is breast augmentation, which is used to improve the appearance of the breast after mastectomy, due to breast cancer or trauma to the organ.
- Low self-esteem and lack of self-confidence are also cogent reasons why people opt for cosmetic procedures. Thanks to the growing trend of body positivity and the increased use of the social media, an increasing amount of people undergo these procedures to improve their appearance, boost their self-esteem, and become more sexually appealing.
- Body Dysmorphic Disorder (BDD), which is a psychological disorder, is another reason why people opt for cosmetic surgery procedures. BDD is a disorder resulting in the individual's preoccupation with what he or she regards as defects in their bodies or faces. This drives the affected individual to seek out these procedures to ensure that this perceived defect is corrected.

### THE BENEFITS OF COSMETIC SURGERY.

Cosmetic surgery is an elective procedure and the underlying reasons why these procedures are employed are highly personal reasons. The benefits of a cosmetic procedure, depends on if the procedure is able to satiate the original reason why the individual opted for that procedure. Regardless, most of these benefits are common among many individuals and are summarized as thus;

- Reversal of changes caused by aging, habits or even natural processes like pregnancy.
- Correction of defects which could be congenital or due to underlying pathologies such as cancer, or due to trauma to that particular part of the body.
- The ultimate benefit of cosmetic surgery is improved body appearance. An Improved body appearance translates to a battened self-confidence, better physical health and enhanced mental health; and as a corollary, sexual appeal is also

augmented.

### THE RISKS AND COMPLICATIONS ASSOCIATED WITH COSMETIC SURGERY.

As with all medical and surgical procedures, there are risks associated with cosmetic surgery. These risks if well evaded or surmounted can enhance the individual's quality of life; but if the procedure favors the risks, it can lead to life-threatening complications.

#### ■ Risk of Surgical Errors.

This key risk cannot be overlooked as it is one of the most common risks associated with cosmetic surgery. For instance, permanent nerve damage is common with rhytidectomy, and can lead to partial or generalized facial paralysis. Its popularity has reduced, due to advancements in technology; however, these errors are almost inevitable and should be put into consideration before any procedure takes place. Error like this can have a negative impact on the individual's self-esteem and in extreme cases, these irreversible and cannot be fixed.

#### ■ Risk of Addiction.

This disadvantage is common among individuals with Body Dysmorphic Disorder (BDD). These individuals believe that cosmetic surgery can treat their condition, but actually cosmetic surgery worsens it. Another complication of this, is the risk of suicide associated with BDD.

#### ■ Recovery Time.

The specific recovery time for a particular procedure may be unfavorable for the individual. The individual is limited from executing some daily activities post-surgery, until the amount of time required for the procedure to heal is exhausted.

#### ■ The Risk of Un- and Under-Qualified Medical Personnel.

This is a less common but very serious risk. The right medical personnel for cosmetic surgery, is very important to the individual opting for such procedures as their life and appearance depends on the success of the procedure. Therefore the eligibility and experience of the medical personnel, should be taken into consideration in cosmetic surgery procedures. Permanent damage and even death could result if this risk is not managed effectively.

#### ■ Mismanagement.

This includes inadequate care of the operated body part, post-surgery, and misuse of drugs (both prescription and over-the-

counter drugs). A very good instance is the pain which is apparent during recovery time; this can push some individuals to misuse drugs such as pain killers which can, as a side effect hamper the healing process. Also the individual might take up activities or fall back to old habits that may interfere with the healing process.

#### ■ Death.

Although it is less common, it is the serious complication of mishandled cosmetic surgery procedures, and can occur during or post surgery. During surgery, it mostly happens due to the individual's reaction to anaesthesia or because of the person's health history. Risks of hematoma formation, fat necrosis, fat embolism, pneumothorax, excessive hemorrhage, infections and development of allergic reactions to implants, are post-surgical complications that can lead to death.

### CONCLUSION

It is human nature for a person to seek out that which he or she is more attracted to in another individual, and also that which would make him or her attract another individual. Cosmetic surgery procedures make it possible for people to batten their physical appearance, and enhance their sexual appeal too. Internet media particularly social media and the entertainment industries have increased the popularity of these cosmetic procedures. These procedures are now more efficient and safer due to advancements in surgical technology and level of expertise in the field; this has, as a consequence, tipped the scale, with the benefits far outweighing the risks associated with cosmetic surgery, as most of these risks can be evaded or forestalled. Despite these, there is more work to be done especially in developing economies, where the level of technology and expertise for these procedures is low or lacking.

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# Contraception And Abortion In Nigeria: Laws And Safe Practices

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## ABSTRACT

Abortion is a cross-cultural practice which has been present through much of world history. From the use of silphium in the times of ancient Greece to the administration of medical abortifacients of modern day, humanity has always devised means to control reproduction.

Advancements in fertility control birthed the era of newer, far less crude methods of contraception as have been used in times past. However, for multitudinous reasons, these methods are inaccessible to certain demographics, leading to the occurrence of unwanted pregnancy—the event of which necessitates an abortion.

In Nigeria, a country marked by several institutional problems of which include a collapsing economy, poor healthcare sector, growing insecurity and increasing unemployment, women do not possess the right to have an elective legal abortion. Safe for when a pregnancy poses a threat to the wellbeing of the mother, abortion is considered a criminal offense, punishable by as much as 7 years imprisonment for the patient and 14 years for the performer. This poses a dilemma to Nigerian women as many fall on backdoor means of pregnancy termination, the consequences of which greatly contribute to maternal morbidity and mortality and are easily preventable through proper legislation that is in keeping with the current need.

This paper seeks to enlighten its readers on abortion as a medical intervention, current abortion legislation in practice in Nigeria, the dangers of such legislation and safe methods of contraception.

## INTRODUCTION

Abortion is defined as the termination of a pregnancy prior to the age of fetal viability or the expulsion of an embryo or fetus of weight less than 500g. The age of fetal viability refers to the point at which a human fetus has a 50% chance at survival in the extra-uterine environment. In Nigeria, this is 28 weeks gestational age. For much of the developing world it varies between 23 and 24 weeks gestational age. The WHO standard is set at 20 weeks gestational age.

An abortion may occur without intention (spontaneous), or with intention (induced) through medical and surgical procedures. In the event of a spontaneous abortion, the popular euphemism “miscarriage” is used.

## ABORTION LAWS IN NIGERIA

Nigeria is home to one of the world's most restrictive abortion laws. These laws were instituted in the 19<sup>th</sup> century by the British colonial government and have not been reformed ever since. They are enshrined in the Criminal Code expressed in Southern Nigerian states and the Penal Code expressed in Northern Nigeria.

Sections 228, 229 and 230 respectively of the Criminal Code state the laws regarding abortion practices and are as follows:

According to section 228, any attempt by a doctor or other individual to procure abortion whether a woman is with or not with child, through the use of poisons or noxious substances, or through force of any kind is guilty of a felony and liable to 14 years imprisonment. Section 229 goes further to say that a woman who procures her own abortion is equally guilty and liable to seven years imprisonment. Section 230 levies a three year sentence on any individual unlawfully supplying items intended to unlawfully procure an abortion.

These laws parallel with those in Sections 232, 233 and 234 of the Penal Code expressed in Northern Nigeria. While the Penal Code makes provision for abortion in the happenstance that the pregnancy endangers the life of the mother, those provisions are not made in the Criminal code.

## STATISTICS ON ABORTION IN NIGERIA

While there are laws criminalizing induced abortion, these have done little to resolve the problem of unintended pregnancies.

The Guttmacher Institute, a US research and policy NGO involved in the advancement of reproductive health and rights worldwide,

estimated that 456,000 unsafe abortions occur in Nigeria every year. Their 2020 report found that 1 in 4 pregnancies in Nigeria are unintended with over 50% of those pregnancies ending in induced abortion. These abortions are chiefly carried out by non-physicians, who employ crude means such as attempting to break the amniotic sack inside the uterus with a sharp stick or pumping toxic mixtures of alligator chilli peppers and chemicals like alum into their patient's bodies. These methods risk complications such as infections, tissue necrosis, sepsis, shock, organ perforation and death.

### CONTRACEPTION IN NIGERIA

Contraception, also known as birth control, fertility control or anti-conception, is at the centre of family planning. It is a means through which pregnancy can be prevented.

The World Health Organization estimated in 2017 that over 200 million women of reproductive age in developing countries have an unmet need for contraception. According to the *2020 Statistical Report on Men and Women in Nigeria*, over 83% of Nigerian women of reproductive age were not using any contraceptive methods against pregnancy. The report found that Yobe in Adamawa state had the lowest prevalence of contraceptive use with 98.1% of women not using any methods. While Lagos state had the highest, with 50.1% not using. These poor rates of use are attributable to many factors such as; religious beliefs, cultural norms, low access to healthcare facilities, and misconceptions in the general public regarding contraceptives. There is widespread belief that contraceptive use affects future fertility and promotes promiscuity. These beliefs are baseless and do not reflect the data on contraceptive use.

### CONTRACEPTIVE METHODS & THEIR EFFICACY

The greatest contributor to the current problem of low prevalence is a lack of medical knowledge. Many Nigerian women are unaware of the vast amount of contraceptive methods, each with their varied levels of efficacy.

Contraceptives work by targeting certain sites or reproductive process in the male or female, ensuring the stoppage of conception. This is made possible through use of various devices, implants, patches, rings, pills, injectables, surgical procedures and sexual practices.

Contraceptive methods can be categorized into traditional and modern. The traditional methods include:

- Coitus Interruptus or Withdrawal method
- Lactational Amenorrhea method
- Rhythm method

**Coitus interruptus or Withdrawal method** involves the removal of the penis from the vagina during coitus prior to ejaculation, preventing seminal fluid from entering the vagina. It is the oldest contraceptive method. Failure rates are high as it is person-dependent, involves self-control and accurately timed removal as seminal fluid may leak into the vagina on its way out.

**Lactational Amenorrhea method or LAM method** is used by nursing mothers. It makes use of the six-month period after parturition and during lactation at which there is post-partum infertility. During the lactation period, the infant's suckling at the nipple stimulates it to send nerve signals to the hypothalamus. This prevents the pulsatile release of GnRH from the hypothalamus and as a consequence, the release of Luteinizing Hormone, LH, from the anterior pituitary. The plasma concentration of Follicle Stimulating Hormone, FSH, is not affected during lactation and so follicular growth occurs as per usual. However, the low concentration of LH means there will be reduced estradiol production by the follicle and an absence of the LH surge which precedes and consequently leads to ovulation. Without ovulation, pregnancy is impossible. However, this method is not totally reliable as a decline in lactation may reduce the impulses sent to the hypothalamus which lifts the blockade placed on gonadotropin release.

**Rhythm method** involves the periodic abstinence from sex during a woman's most fertile period. This method is non-effective for women who have irregular periods or during menopausal years. It is not a reliable method as there are no days in the menstrual cycle which a woman is completely without risk of attaining pregnancy.

The modern methods of contraception include

- Long-Acting Reversible Contraception (LARCs)
- Hormonal methods
- Barrier methods
- Emergency contraception
- Sterilization

**Long-Acting Reversible Contraception (LARCs)** is the most efficacious method of contraception. It includes the use of intrauterine implants and devices. These are the copper intrauterine device (Cu-IUD), the levonogestrel intrauterine system (LNG-IUS) and the progestogen-only implant.

The Cu-IUD & LNG-IUS methods involve the insertion of a small T-shaped device into the uterus. This device stays in place and may remain for a given number of years. The LNG-IUS device releases levonogestrel, a progestin, which causes cervical mucus thickening and thinning of the uterine lining, which inhibits the sperm from travelling up to meet the egg. It also prevents the egg from being released properly. The Cu-IUD works in the same way and in the event of fertilization, prevents implantation through its presence on the uterine wall. It may remain in the uterus for 10 years. This method is not recommended for women with cervical cancer, cancer of the uterus, unexplained vaginal bleeding or pelvic tuberculosis.

Progestogen-only implants are flexible, plastic rods which are implanted into the uterus and can last up to 5 years. Like LNG-IUS, they work to release progestins and through the changes on the uterine lining and cervix, prevent fertilization.

With failure rates of less than 1%, LARCs are one's best bet at

pregnancy prevention. However, use of these devices is not without foreseeable complications. As at January 2023 in Nigeria, a Cu-IUD costs between N1000 to N2000 in government hospitals while other hormonal IUD brands like DKT, Elicora and Optima cost N1,000. Paraguard IUD is N7000. Mirena (LNG-IUS) costs about N30,000 – N70,000 and Implanon, a progestogen-implant, costs between N2000-N4000 per packet.

**Hormonal methods** include the use of Combined Hormonal Contraception which are available in oral pills, transdermal patches and vaginal rings. The most popular hormonal method is through use of “the pill”, otherwise known as COCs. Combined Oral Contraceptives or COCs are combination pills of a synthetic estrogen and progestin, which work to inhibit ovulation from occurring. They are released in low doses daily and may be monophasic (same dose throughout) or phasic (different doses).

A tablet is taken every day for 21 days followed by a 7-day pill free interval during which 7 placebo tablets may be taken in its place. This 7 day period results in the withdrawal bleed. A pack of COCs may go for N1,500 and upwards depending on the brand.

Transdermal patches and Vaginal rings work similarly by releasing low doses of the drug over a period of time. For transdermal patches, this is 7 days, and the patch is to be placed on any area of skin except the breast. Vaginal rings are worn for 21 days followed by a 7 day free period during which withdrawal bleed occurs. These are not readily available in Nigeria. In cases of discomfort, vaginal rings can be brought out for a period of 3 hours, cleaned and replaced.

Progestogen-only injectables such as Sayana Press are available in Nigeria. They cost around N3,000 per injection and a dose is given every three months. Progestogen-only pills (POPs) are taken throughout the entire cycle.

Hormonal methods are relatively less efficacious than LARCs due to the possibility of missing doses and injections.

**Barrier methods** are by far the most commonly used modern contraceptive method in Nigeria today. They include the use of male condoms or diaphragms used in conjunction with spermicides. They are the cheapest and most accessible means of contraception. However, there is a high failure rate.

**Emergency contraception** is taken hours after unprotected sex or in the event that your choice of contraception, such as a male condom, has failed. The Cu-IUD can be used as emergency contraceptive and removed when pregnancy has been excluded or kept in place. Other methods of EC include use of pills such as levonogestrel (LNG 1.5 mg) and progesterone-receptor modulator Ulipristal Acetate (30 mg). LNG is effective for up to 4 days after unprotected sex while Ulipristal Acetate is effective for up to 5 days.

**Sterilization** consists of procedures that permanently prevent pregnancy occurrence. These include surgical procedures like a vasectomy, hysterectomy or tubectomy. These may be considered in individuals who no longer want to continue their reproductive

careers.

## CONCLUSION

Abortion is a necessary medical intervention which can save the life of a woman. It is common knowledge that restrictive laws do not deter women from having abortions. They only increase the rate of unsafe abortions, putting both mother and unborn fetus at great risk of complications. There is dire need presently for reform with regards to abortion laws in Nigeria and for policies to be put in place to increase the prevalence of contraceptive use country-wide.

# Criminalization Of Suicidal Attempts In Nigeria: To Stay Or To Go.

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According to Center for Disease Control, a suicide attempt is when someone harms themselves with any intent to end their life, but they do not die as a result of their actions.

Although developed nations have the highest number of suicides and attempted suicides, it is however on a rapid rise in developing countries like Nigeria. The causes of killing oneself have been linked to factors such as biological and sociological influences. One may wish to end their life when they feel they are worthless, hopeless and even depressed over loss of loved ones, inability to get a job or feeling of rejection.

This is a very sensitive case, and it is deterrent that the Nigerian government sees attempted suicide as a criminal offence rather than a cry for help. For the southern part of Nigeria, Section 327 in the Criminal Code Act states that:

“Any person who attempts to kill himself is guilty of a misdemeanor, and is liable to imprisonment for one year.”

Likewise, in the Northern states, Section 231 of the penal Code states that:

“Whoever attempts to commit suicide and does any act towards the commission of such offence, shall be punished with imprisonment for a term which may extend to one year or with fine or with both.”

It is important to note that the act of suicide in itself is not a criminal offence, rather a failed suicide is illegal. Why should the depressed be treated as criminals when they're meant to be carefully handled by their government as patients or as those in troubling needs?

I strongly stand on the decriminalization of suicidal attempts for the following reasons:

1. The foundation for criminalizing suicidal attempt has always been from a religious point of view, with no prior research as to the psychological and social impacts of such basis. The bible clearly states that thou shall not kill, so this has been used on similar arguments why suicidal attempts must be condemned. The catholics went as far as excommunicating members who attempted suicide from the church. Creating a national law that affects every single citizen just based on religious perspectives is not comprehensive and it's inadequate, and such laws must be

abolished.

2. A solution given to a problem is meant to substantially solve the problem, or reduce its challenges to a minimum. Criminalization of suicidal attempt has in no way reduced the rate of such acts in the country, instead, those who are having personal crises or in a state of depression are now, more than ever, unable to speak up regarding these issues. They are largely afraid that the society would be stereotypical towards them, since the law has given provisions for them to be treated as criminals insofar they have suicidal tendencies. The rates of suicidal attempts and suicides have worsened, as one who would've ordinarily spoken out and counselled against taking their life, will be left with no choice than to go ahead and do it anyway, to avoid further judgements.
3. Criminalization of suicidal attempt does not in any way promote the progress of the country. It does not affect the economic or environmental growth of the nation. What the nation needs in this regard is healing, and not reprimand. These people need our love, and not our resentment.

In light of tasking ourselves to bring better solutions that could curb suicides and suicidal attempts, I will strongly advise on the following propositions:

1. Constitutional Amendment: The provision under the Nigerian constitution that criminalizes suicidal attempts should be abolished, and newer provisions on the next possible steps must be provided to appropriately handle such cases.
2. Mental Health Institution: Those found to have attempted suicides, or have such suicidal tendencies must be appropriately offered a mental analysis help, where they can discuss their burdens and rightly offered professional help as the case may be.
3. Empowerment Programs: Programs should be created to help these individuals with funds and other needs if the source of their suicidal tendencies is out of physical stress like poverty, loss of jobs, etc. This may not be the case if it

were from a psychological cause.

4. Awareness Campaign: A widespread awareness campaign should be launched by mental health activists, where citizens are enlightened on the scopes of depression and suicides. This brings them full knowledge of the possible help that can be proffered to them if need be.
5. Emergency Call: An emergency number should be provided by states or by the federal government for immediate access to help whenever one feels like taking their own life or whenever you find someone in a position of committing suicide. The hot line serves a direct link to a psychiatrist, therapist or a counselor as the case may be.
6. NGO Involvement: Non-Governmental organizations should take it upon themselves to add mental awareness campaigns to their activities, and ensure these topics are taken from the grassroots to those in urban societies.

#### CONCLUSION:

We must abolish the religious and cultural ideas that empower criminalisation of suicidal attempt as a people, and understand that such persons need our love and support, and not hate and resentment. Those who attempt suicide out of frustration or mental stress are not criminals and must not be seen or treated as one.

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# The Maputo Protocol Vs Nigerian Law: A Brief Overview

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A lot of people engage in sexual intercourse, but not all of them do it with the intention of having children. Hence it's only natural people would seek to either avoid the issue or "correct" it when avoidance fails. This is where contraception and abortion come in.

Engaging in the use of contraception and abortion is not so simple and straightforward. There are different laws on the issue and they vary from country to country. Countries whose laws are theocentric tend to frown on any manner prevention of childbirth because it is seen as taking a life. While countries with more circular constitutions tend to be more liberal. Although there is a point of confluence between the laws of different countries, and this is the legality of abortion to save the life of the mother.

## **RELEVANT LAWS IN NIGERIA**

The use of contraception is not exactly a crime in Nigeria, although it is the subject of numerous legal debates. So this section will focus more on abortion. In criminal law, the North applies the Penal Code while the South applies the Criminal Code.

### **Under the Penal Code:**

#### **232. Causing miscarriage.**

*Whoever voluntarily causes a woman with child to miscarry shall, if such miscarriage be not caused in good faith for the purpose of saving the life of the woman, be punished with imprisonment for a term which may extend to fourteen years or with fine or with both.*

#### **233. Death caused by act done with intent to cause miscarriage.**

*Whoever with intent to cause the miscarriage of a woman whether with child or not does any act which causes the death of such woman, shall be punished-*

- (a) with imprisonment for a term which may extend to fourteen years and shall also be liable to fine, and*
- (b) if the act is done without the consent of the woman, with imprisonment for life or for any less term and shall also be liable to fine.*

#### **234. Causing miscarriage unintentionally.**

*Whoever uses force to any woman and thereby unintentionally causes her to miscarry, shall be punished-*

- (a) with imprisonment for a term which may extend to three years or with fine or with both, and*
- (b) if the offender knew that the woman was with child, he shall be punished with imprisonment for a term which may extend to five years or with fine or with both.*

#### **235. Act done with intent to prevent child being born alive or to cause it to die after birth.**

*Whoever before the birth of any child does any act with the*

*intention of thereby preventing that child from being born alive or causing it to die after its birth and does by such act prevent that child from being born alive or causes it to die after its birth, shall, if such act be not caused in good faith for the purpose of saving the life of the mother, be punished with imprisonment for a term which may extend to fourteen years or with fine or with both.*

#### **236. Causing death of quick unborn child by act amounting to culpable homicide.**

*Whoever does any act in such circumstances that, if he thereby caused death he would be guilty of culpable homicide, and does by such act cause the death of a quick unborn child, shall be punished with imprisonment for life or for a less term and shall also be liable to fine*

### **Under the Criminal Code :**

#### **228. Attempts to procure abortion.**

*Any person who, with intent to procure miscarriage of a woman whether she is or is not with child, unlawfully administers to her or causes her to take any poison or other noxious thing, or uses any force of any kind, or uses any other means whatever, is guilty of a felony, and is liable to imprisonment for fourteen years.*

#### **229. Attempt to procure own miscarriage.**

*Any woman who, with intent to procure her own miscarriage, whether she is or is not with child, unlawfully administers to herself any poison or other noxious thing, or uses any force of any kind, or uses any other means whatever, or permits any such thing or means to be administered or used to her, is guilty of a felony, and is liable to imprisonment for seven years.*

#### **230. Supplying drugs or instruments to procure abortion.**

*Any person who unlawfully supplies to or procures for any person any thing whatever, knowing that it is intended to be unlawfully used to procure the miscarriage of a woman, whether she is or is not with child, is guilty of a felony, and is liable to imprisonment for three years.*

*The offender cannot be arrested without warrant.*

#### **297. Surgical operations.**

*A person is not criminally responsible for performing in good faith and with reasonable care and skill a surgical operation upon any person for his benefit, or upon an unborn child for the preservation of the mother's life, if the performance of the operation is reasonable, having regard to the patient's state at the time and to all the circumstances of the case.*

**309. Death by acts done at childbirth.**

*When a child dies in consequence of an act done or omitted to be done by any person before or during its birth, the person who did or omitted to do such act is deemed to have killed the child.*

**328. Killing unborn child.**

*Any person who, when a woman is about to be delivered of a child prevents the child from being born alive by any act or omission of such a nature that, if the child had been born alive and had then died, he would be deemed to have unlawfully killed the child, is guilty of a felony, and is liable to imprisonment for life.*

The above makes it quite clear that Nigeria frowns on abortion and other related acts except when it is to save the life of the mother.

**The Law Vis a Vis Safe Practices**

Saving the life of the mother is just standard and not contentious in any way. Issues arise when abortion is being procured for reasons other than where the birth poses an immediate threat to one's mortality. In Nigeria, you can't just walk into a hospital and request for an abortion seeing as it is a crime. This doesn't mean people don't procure abortions, they still do.

The relevant questions are, from where? From whom? At what cost?

Abortions being illegal makes it impossible to procure or undergo the process in a certified hospital and more often than not those administering the procedure are quacks unqualified to hold a scalpel or recommend medication to human beings. But because people have no other options they go to these dangerous places and quacks. The amount of women who die from unsafe abortion procedures is alarming.

One thing becomes quite clear, something has to be done about it. The law should be made to serve and protect the citizens, and any law which leads to more harm than good should be looked into.

A total of 73 countries have completely legalised abortion, ( up until the recent overturning of **Roe V Wade in USA**, that number was 74), they Include: Croatia, Norway, Australia, Belgium, France, South Africa, Thailand etc. One thing is certain, mortality ratio and injuries (of the mothers ) resulting from abortion procedures are far lower in the countries that have legalised abortion are far lower than in countries such as Nigeria that have criminalised it. The reason being these women have access to proper healthcare, medicine and counselling. In places like Nigeria where it is a *hush hush* process of *hide and seek*, these women are exposed to just about anything, from quack doctors, to unsafe and contaminated labs and medical instruments.

In some countries, such as France, abortion is covered by most health insurance plans. Also, in most countries, there are organizations that offer support to women who are considering or have had abortions. These organizations can provide information about the procedure, help women find a qualified doctor, and offer emotional support.

Now that abortion is no longer legal in USA, it is quite safe to say that incidents resulting from abortion will see a huge spike, as people will no longer have ready access to safe abortion facilities

and qualified personnel.

One funny thing about Nigeria's legislation on abortion is that there is a conflict. Nigeria ratified and domesticated the **African Charter On Human And People's Rights (ACHR)**, and it's extension **The Maputo Protocol**. The curious thing about this is that the Maputo Protocol provides for a woman's right to abortion and the fact that it has been domesticated means it should be applicable in Nigeria. **Article 14 of the Maputo Protocol** provides thus:

*1. States Parties shall ensure that the right to health of women, including sexual and reproductive health is respected and promoted. This includes:*

- a) the right to control their fertility;*
- b) the right to decide whether to have children, the number of children and the spacing of children;*
- c) the right to choose any method of contraception;*
- d) the right to self-protection and to be protected against sexually transmitted infections, including HIV/AIDS;*
- e) the right to be informed on one's health status and on the health status of one's partner, particularly if affected with sexually transmitted infections, including HIV/AIDS, in accordance with internationally recognised standards and best practices;*
- g) the right to have family planning education.*

*2. States Parties shall take all appropriate measures to:*

- a) provide adequate, affordable and accessible health services, including information, education and communication programmes to women especially those in rural areas;*
- b) establish and strengthen existing pre-natal, delivery and post-natal health and nutritional services for women during pregnancy and while they are breast-feeding;*
- c) protect the reproductive rights of women by authorising medical abortion in cases of sexual assault, rape, incest, and where the continued pregnancy endangers the mental and physical health of the mother or the life of the mother or the foetus.*

The above permits abortion in a wide variety of cases such as incest or to protect the mental health of the mother, this is similar to what is obtainable in the 73 countries that legalise abortion. If we are to protect our women and ensure their safety when it comes to abortion, applying the **Maputo Protocol** which is already a part of our laws is the best bet.

# Autism Spectrum Disorders

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A Swiss psychiatrist (Eugen Bleuler) was the first person to use the term. He started it around 1911 to refer to one group of symptoms referring to schizophrenia. Autism has been referred to as a range of neuropsychological conditions. Donald Triplett was the first person to be diagnosed with autism. The word Autism generally originates from the word Autos which means "self". It describes conditions in which a person is removed from social interaction i.e. isolated self. Autism can be simply put as the lack of one's ability to simply express ones thought logically and clearly. It has been shown that at least 30% of individuals with autism have spontaneous de novo mutations that occurred in the father's sperm or the mother's egg. Autism is an inborn disease (from birth) or appears at a young age and it cannot be cured but can be improved over time and with a trained personnel. There are two levels of autism that is high functioning autism and low functioning autism. Those with high functioning autism tends to learn things at a quicker pace than those with low functioning autism.

The different types of autism spectrum disorder includes autistic disorder, Asperger syndrome and pervasive developmental disorders (PDD). Autistic disorder otherwise known as classic autism. People with classic autism usually have significant language delay, social and communication challenges and unusual behaviours and interest and intellectual disabilities. It is what most people think about when they hear the word autism. Asperger syndrome have milder syndromes like social challenges and unusual behaviour and interest but no fault with their language or intellectual ability. PDD is also known as "atypical autism" it also has milder syndromes like Asperger syndromes like social and communication challenges.

Autism has different challenges but some common challenges are the anxiety: anxiety is a normal part of development, but research confirms that people with autism experience elevated levels of anxiety in comparison to their typically developing peers. "...the inability of people with autism to communicate feelings of disturbances, anxiety or distress can also mean that it is very often difficult to diagnose depressive or anxiety states" (Howlin 1997). Anxiety manifest in an autistic person through social phobia, excessive worry/rumination, obsessive compulsive disorder, hyper-vigilance, or seeming 'shell shocked', phobias, avoidance behaviours, rigid behaviour and resistance to change, stimming or self-injurious behaviours, controlling behaviours or oppositional defiance, meltdowns and shutdowns. "Reality to an autistic person is a confusing, interacting mass of events, people, places, sounds and sights... Set routines, times, particular routes and rituals help to

get order into an unbearable chaotic life. Trying to keep everything the same reduces some of the terrible fear" (Jolliffe et al 1992). Parents who also have autistic children with autism sometimes describe feeling "overwhelmed, guilty, confused, angry, depressed". They may feel frustrated with their children clumsy, unresponsive, angry or disregarding of others. Individuals often judge those parents who have autistic children unfairly. Parents also worry about how the children would cope not only in the present but also in the future.

Studies have shown that early diagnosis and intervention can have a positive impact on life outcomes for children with autism. The sooner the diagnosis is made, the sooner the child can access help through speech and other types of therapy. If a child shows autism it is better to seek advice rather than ignore them. With the intervention about 3% of the children with ASD will ultimately "lose" their diagnosis. These are usually children with high functioning autism. Therapy can help them to maximise their strength and overcome certain difficulties. For this reason, they urge parents to seek a specialist diagnosis, the more suitable the intervention will be. Apart from specialised diagnosis government should enlighten the citizens about autism spectrum disorder and its effect in the society at large.

For parents who have children affected by autism, it is not the end of the world and people should not discriminate among those with autism.

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# The Truth About HIV/AIDS

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HIV/AIDS is an immune disease that does a whole lot to the cellular immunity cells of your body, destroying them till their levels are dangerously low.

Symptoms of HIV/AIDS range from mild to very severe depending on what stage the virus is in, though it's imperative to note that these symptoms are not definitive, but indicative as they can be for any other disease with shared symptoms with that of HIV/AIDS. At the initial stage, symptoms are generally flu-like but as the infection progressively weakens the immune system, they can develop other signs and symptoms, such as swollen lymph nodes, weight loss, fever, diarrhea, and cough.<sup>1</sup>

HIV/AIDS is primarily transmitted through infected body fluids such as blood, semen, and vaginal secretion. HIV/AIDS cannot be transmitted through saliva, hence the answer to the question of if HIV can be transmitted through kissing, except in the case where both parties have open mouth sores. This begs the question: "If HIV/AIDS is all about its transmission from one person to another, who started it all?"

According to Sharp & Hahn (2011), close simian relatives of HIV-1 and HIV-2 were found in chimpanzees (Huet et al. 1990) and sooty mangabeys (Hirsch et al. 1989), respectively. These relationships provided the first evidence that AIDS had emerged in both humans and macaques as a consequence of cross-species infections with lentiviruses from different primate species (Sharp et al. 1994)<sup>2</sup>

Like every other deviation from normalcy in the human body, HIV/AIDS has detrimental effects on the human body, especially the body's immune system. This is how it works:

1. You get infected
2. HIV targets your body's cellular immunity cells (T-cells/ CD4 cells)
3. Your body tries to fight it off by producing antibodies
4. Mostly always destroys your T-cells
5. Reduced immunity
6. Any pathogen that comes along becomes yours
7. Increased chances of death.

This chain of events is avoidable and can be managed with proper treatment - Anti-retroviral therapy.

You must be wondering about the truth I was about, well, here it is: a person with HIV/AIDS can lead a very normal life even without so many doctors poking at you. The science is this: Viral load. T-cells/CD4 helper cells which are the prime target of HIV/AIDS have a range of 500-1500 in a normal human body. A properly managed person infected with HIV/AIDS can have a count very close to the minimal range. A person like this chose the bitter truth and that fostered early detection and better management.

This is also possible for someone whose immune system is doing a really good job at staving off a medium infection. Cases like this are not common but in both cases, these people lead a normal life because the level of HIV is not enough to overcome their body's acquired immunity. There's even more good news: A woman in Argentina has become only the second documented person whose own immune system may have cured her of HIV!<sup>3</sup> This truth presents hope to the millions of people around the globe who are living with HIV.

HIV is not a death sentence if it is efficiently managed but can progress to AIDS, a more advanced stage of the illness if not properly managed. Innovative technology has fostered better treatment methods for HIV, and with time, will get even better. The lie isn't that beautiful and the truth is not bitter. HIV can be managed with an impressive life expectancy, and all we have to do is start early.

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# One Day Writers Would Lose Their Job To AI. True Or False?

Victor Mokwe

## Introduction



Additionally, many writing jobs require a deep understanding of specific industries, cultures, and audiences, which AI is not yet able to replicate. For example, a human writer with experience in finance will be able to produce more accurate and informative content about financial markets than an AI model.

On the other hand, it is also important to consider the ways in which AI can augment and support human writers, rather than replacing them entirely. For example, AI can assist with tasks such as data analysis, research, and editing, which can free up time for human writers to focus on more creative and strategic tasks.

In conclusion, while it is possible that AI could automate some writing tasks, it is unlikely that it will completely replace human writers. Instead, AI will likely augment and support human writers, allowing them to produce higher-quality content more efficiently. Therefore the statement "Writers would lose their jobs to AI" is False.

**Body**

On the one hand, the model above written by OpenAI's GPT-3 challenges the intellectual security of the layman or low-skilled writers by the efficacy with which it easily applies the elements of writing to initiate and organize ideas into the structure of an essay. AI like Grammarly and Open AI have succeeded in writing news articles, generating content based on algorithms, and performing certain traditional writing such as drafting, blogging, proofreading, fact-checking, and formulaic/repetitive writing, begging the question, what becomes of the fate of proofreaders, blog writers and content writers who would be displaced from their offices?

On the other hand, the same model could serve as a template or advantage to professional writers who are tasked to go beyond the time-consuming and crude aspect of writing, applying creativity and the best use of language to generate nuance and express original ideas in literature (novels, journals) designed to compel or convince a given audience. Indeed, AI has not advanced enough to take up the complex, analytical, creative and emotional writing by professional writers like journalists and novelists whose work, unlike the low-skilled writers', would appreciate and utilize the role of AI as a writing tool. Nevertheless, there is an inevitable future where AI will dominate a great portion in the writing industry, fundamentally serving as instrument in man's workshop designed to assist rather than unseat writers, buying enough time for the creation of a masterpiece.

In the grand scheme of things, there are two sides to the debate about the potential dominance of AI over writers emanating from the uneven distribution of wealth in society (1). Developed countries imbued with state-of-the-art scientific and technological facilities and advanced intellectual resources are favourably entitled to modern innovations in these parameters. Global economic interactions and competition between these countries to maintain or upscale in ranking generate intense pressure for productivity in the job market, which further raises the bar for performance, ingenuity, skill, and creativity in the pool of workers(1). While it is at the core of this competition that milestone breakthrough in science and technology like spacecraft, nuclear power, and AI are birthed, it is also because of this competition that developing/underdeveloped countries and primitive societies in the low end of wealth-ranking and intellect are completely left out on the trajectory of modernization and become victims of the advancements in science and technology (1). The analogy of the layman and professional writer used above is the grass root representation of this deep rooted division in society that contributes largely to the opposing and negative perception and acceptance of AI in the writing industry.

**Conclusion**

There is hardly any competition between man and AI and this can

be seen in the stark difference between this essay and the Open AI's response above. The seeming competition between writers and AI is the culmination of the actual competition between writers themselves in an industry that is increasingly demanding maximum performance and quality; it is a call for the layman and low-skilled writers to evolve in expertise in the face of a rapidly changing job market and a digital 21<sup>st</sup> century. To mask AI a threat to its creator and mastermind (man) defeats the very purpose for which it was created because in the grand scheme of things, man will always be steps ahead of AI in the pursuit for originality and ingenuity and AI will forever be limited by the "Artificial" in its very meaning.

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Oleji Chiamaka (Feature Editor I)  
 Mokwe Victor (Feature Editor II)

# Anomaly

Victor Mokwe

Iheuwa was at it again, reading his most treasured jotter out of the many stacked on the shelf in his lodge. While most of these jotters are like his second brain—coffers for his memory—containing lists of things to do, events, schedules, his thoughts, and even people's comments he considered worth remembering, this special jotter he tagged 'Home' contained fond stories his mother told him growing up, the fondest of them all being this story about his home in the village. It has been years, but the memory was still ripe in his mind from rereading: his child-self welching 'Time Time!' to the ageless opening 'Once upon a time' accentuated by his mother's lyrical dialect seated by the side of his mat; his mother, in the manner of an exorcist, quickly shunning the native response common to the children in the village. His preened and innocent face wore the look of disappointment after having the excitement of his tradition stolen from him by his mother who seemingly was partisan with where the loyalty of her love and nurture laid—whether with the overly objective, logical, and modern 21st century or with the momentary ecstasy in his traditional choice of response.

His mother's reproach was good-intended, but the subtle-funny irony in the lesson forced a broad smile that manifested out of Armstrong's flashback and showed in the raised corners of his mouth, the wrinkled corners of his eyes and chubby face. The smile became a chuckle that vaporized the scene of his memory, whisked it to its chambers, pushing his presence out of his head, through his eyes and out into the setting of his self-contained lodge reddened by the twilight of the Saturday evening.

"He lived in the village and was a villager. What was the point of being a villager if he could not live like one. Could he not at least do what fellow villagers did?"

Unconventionality was the lining of his story, this story; a direct message from his mother about his root and the forces behind his growth and wayfaring in life; the reason he still reads it after nine years of exchanging calls and letters and a few-days visit to the village over Christmas breaks since he left home to the city for his university education. He wondered, though, how much his infant aspiration for greatness had driven and transformed him into the elderly-minded maverick that set him on a straight course in life. He is an adult now, ever confident, intellectual, sophisticated, and more self-established than his teenage self was. So, what was he doing reading the same story from the same jotter, in his early twenties? He was baffled because he had no rational answer to this question.

Was it the sense of obligation that he gleaned from the last words his father said to him before he boarded the bus that drove to Nsukka Peace Park, and then by shuttle into the University of Nigeria campus?

"Always remember where you come from." Armstrong mouthed each word into the hollow of his room as though to give it flesh and breathe life into it.

Maybe it was the urge to keep home close, not Uncle Ikechukwu's house in the city where he spends the holidays, but his home in the village. or nostalgia that drags his body like some puppet every semester to sit before the wooden table set sprawling a great width against the wall opposite his bed space and take out the old and shriveled jotter from his drawer to read.

Maybe he wanted to be reminded of the author of the story-- his mother, Ngozi Anyanwu-- and credit her dynamic astuteness and wisdom. She really is an innately intelligent woman, his role model; a nurse to a course that degrade and limit her. She could be much more if she dared to explore her prowess beyond the borders of *Odinazu*. But it is not that she wasn't daring enough; she could walk into a lion's den for a trophy. But in this case her trophy laid in *Odinazu* village community. She chose the compassion, humility, and demanding sacrifice of serving as a nurse over self. It wasn't entirely a case to ponder, even Jesus preached that a prophet is not recognized in his home, and she was no different.

Armstrong was grateful, grateful to his mother for using him as the centre character in the story, grateful to his parents for successfully raising a queer child. He is Iheuwa Armstrong Anyanwu with forgetfulness and a memory that cannot hold water, yet his kind are called 'unique brains' for tinkering and processing information at a faster and extensive rate. Even then his only friends were made of paper and ink. At the village primary school, Iheuwa learned to read and write long before the other children. Where his classmates saw notches of ink on incomprehensible pages, he saw light, streets, and people. Words and the mystery of their hidden science fascinated him, and he saw in them a key with which he could unlock a boundless world, a haven from his current reality: those troubled days in which he felt like a stranger, if not an outcast in the village community but a jewel in his home. Reading cleansed but alienated him. It tightened his grip on the mace of erudition but released it on the normal: discovering and unravelling the workings of the universe made him feel invincible. Knowledge, he reasoned, was

the magic of the gods, a god factor or blueprint, some unique identity that placed gods in echelons of power because they knew more and therefore can do and maneuver more. The more he knew the more he felt godly over those that did not know. The once rugged bark of vulgarity that clung to his character was gone, pared by each book he read.

Growing up, friends casually called him hyperactive for always being fiery and flighty, tapping his foot or fingers to remain active while seated or at rest. They called him 'white people material' for being impulsive and unpredictable, for taking risks and sometimes tantrums with intellect and the stimulation of being productive, for just not knowing when to quit activity.

But he knew better at the age of fifteen, he knew he had Attention Deficit Hyperactivity Disorder (ADHD). He did not need a doctor to diagnose his condition for him. It diagnosed itself. Maybe his friends saw 'white people material' in the way he grew to be inquisitive about everything. Maybe he was never destined to be 'black people material'. He questioned every illogical aspect of Igbo culture since childhood, from the overly dramatic annual new yam festival to even storytelling under full moonlight.

He often wondered if culture still required young boys to bow when greeting an elder, and girls, genuflect. If the female gender was still second-place in hierarchy or entirely out of the picture in most events like property inheritance. Why spider webs at the corners of a house are interpreted as a sign of spiritual attack by one's enemies rather than the natural habitat of spiders? Why barrenness is interpreted as the product of some evil spell or curse tracing the matrilineal lineage of the household? Why *Atuere/Ukwu agba* shoe are believed to be invoked mischiefs or deprecations, but are diseases like elephantiasis and measles that can be prevented and treated? Why Igbo mythology crave *Arusi...* spirits and deities, or worse still, worship inanimate objects, attributing infinite godliness and glorious life to the lifeless? Why people were deemed property of the gods with *Osu*, and completely forbidden from interactions and relationships whatsoever?

(Is it just human nature to search for the source of the sophistication of the human species by reconciling it with almighty gods and supernatural beings? Or is the origin and function of religion tailored to serve as the opium of the masses, somewhat, a check and balance on the pliable and unpredictable character of man?)

Does appealing to an immaterial world avoid certain important questions that deserve answers? It is no longer heresy that we are in fact physical beings, that our brains are the source of mental life: our emotions, decision-making, passions, pains, and everything else we perceive outside of ourselves. So, for the sake of a conventional and conservative society and culture, must we continue to take the literature and proponents of Academia with a pinch of salt? Is it not the big picture to migrate from the *Dark Ages* to the *Age of Reason and Enlightenment*?

Biologists and psychologists would be quick to point as evidence that damage to the brain can have profound effects on who we are. Examples ranging from the historical case study of Phineas Gage whose character and disposition were completely transformed by his head injury, diseases like syphilis that disrupt the will of consciousness, alzheimer's that rob you of your rationality, to coffee and alcohol that inflame desires.

Are these actual evidence that physical events that affect the brain can affect ourselves or some theatrical science fiction attempting to animate the mundane nature of science? Our joys, sorrows, beliefs, memories, ambitions, love, romance, sense of personal identity and free will, in fact, no more than the behaviour of a vast assembly of nerve cells and molecules?

On second thoughts, could this be the secret of miracles, the unaccountable? A manipulation of undiscovered and unknown knowledge by greater powers? Are we faithful followers and believers in religion because we have failed to traverse the 'out-of-bounds'?)

Immersed in this conflict between logic and religion, between the rational principles behind his upbringing and the tradition of the outside world nearest to him (his village), there was so much out of place and backward to have allowed enough room for his young mind to evolve into the forward-thinking mindset he had now. Luckily, he not only had ADHD but also and above all, he had his parents who verily believed in him, in his theories of traditionalism, in his uniqueness and difference. It is his kind of people that create the sparkle that makes the world so diverse and interesting, and makes others feel normal and for that he should never feel any less normal, they said.

Okeji Chiamaka (Feature Editor I)  
Mokwe Victor (Feature Editor II)



# Needles

I remember it like it was yesterday  
Dark slim fingers and prominent veins  
Clutching onto the needle and white cloth  
As my mum taught me how to stitch

With lips slightly parted she would use  
the tip of her tongue to touch the thread  
Sliding it with ease through the needle eye  
My mum used to sew and I loved it  
I dreamt of being a seamstress

It drew me so close to my mum  
So when she told my sister and I  
that female circumcision was just like sewing  
I believed her

I wasn't scared when she said infibulation, like sewing,  
Is where they use a razor to cut off an unnecessary  
part of the fabric of my genitals  
And then use a needle to stitch what is left  
She told me it would hurt for a while and stop

Like our frequent needle pricks  
Little did I know that pain wasn't just physical  
Wasn't just like hunger pangs or bruising a knee  
Why did she use something she knew I loved

**Okeji Chiamaka** (Feature Editor I)

**Mokwe Victor** (Feature Editor II)

# Welcome To Clinicals

Agubama Francis (Fimbaralis Longus)

"11:27AM and ticking away", whispers the Casio wristwatch to your tired eyes glowing in weariness. Pharmacology class is ongoing, and the whole class had just erupted in laughter to one of professor Shu's sarcastic chip-ins. Abruptly jerked into conscious alertness by the sudden uproar, your making a sense out of the Drugs Development lecture is a serious struggle even as your intestines rumble in hungry emptiness. Break-time is still far away, and hours of more lectures, in like manner of patient foot-soldiers, eagerly wait in line. Week in, week out, this routine would go like a merry-go-round. And as you sit there gazing at the ceilings of the aged lecture hall, a surprising question keeps hitting the cellars of your fuzzy mind: "Is this really the life you have chosen to live?"

Medical school, they say, is very demanding. And so far, it is becoming overwhelming. But weeks back, it was with the excitement of an elated hummingbird, the eager enthusiasm of a happy child who had just received an early birthday gift, that you resumed the clinical phase of your medical training. But now, you live your life throughout the weekdays earnestly looking forward to the arrival of weekends, like an expectant child whose mother is yet to return from the market. And disappointingly yet when the weekend finally arrives, it again fast fizzles away like a candlelight in the wind – lending credence to the popular saying that "weekends are made in China". They never ever last! Piles and piles of lecture materials craving your reading indulgence.

The courses have changed. Each had borrowed a leaf from the basic preclinical courses of Anatomy, Biochemistry and Physiology. There are Pathology and Pharmacology now, a duo dubbed as the bedrock of clinical and diagnostic medicine.

Pathology is a four-headed beast; a necessary evil garbed in a thick fabric of vastness. Morbid Anatomy is its one head, stuffed-up and heavy with a complex load of all known human maladies.

While the preclinical course of Anatomy had done the foundational job of guiding you through the human body in its normal and healthy state, Morbid Anatomy is now here to demystify the same human body in its altered, diseased state. It will spark your intellect with intriguing mechanisms of inflammation and of tissue repair, body defense components and their defects. You will come to learn why it is called the father of autopsies and cancers, and of the genetic and molecular basis of diseases.

Haematology is another of pathology's four heads. It is red with the hue of blood and all of its deformities; the anemias and leukemias, hemophilias and lymphomas.

Microbiology, by means of aided eyes, will introduce you to the seemingly invisible world of microbial lives: bacteria -- the gram positives and the gram negatives; and the viruses, and all other microscopic organisms militating against man's very existence.

As for Chemical pathology, it investigates the body's metabolic systems, checkmating the imbalances in electrolyte concentrations. Little wonder it is christened the "clinical Biochemistry".

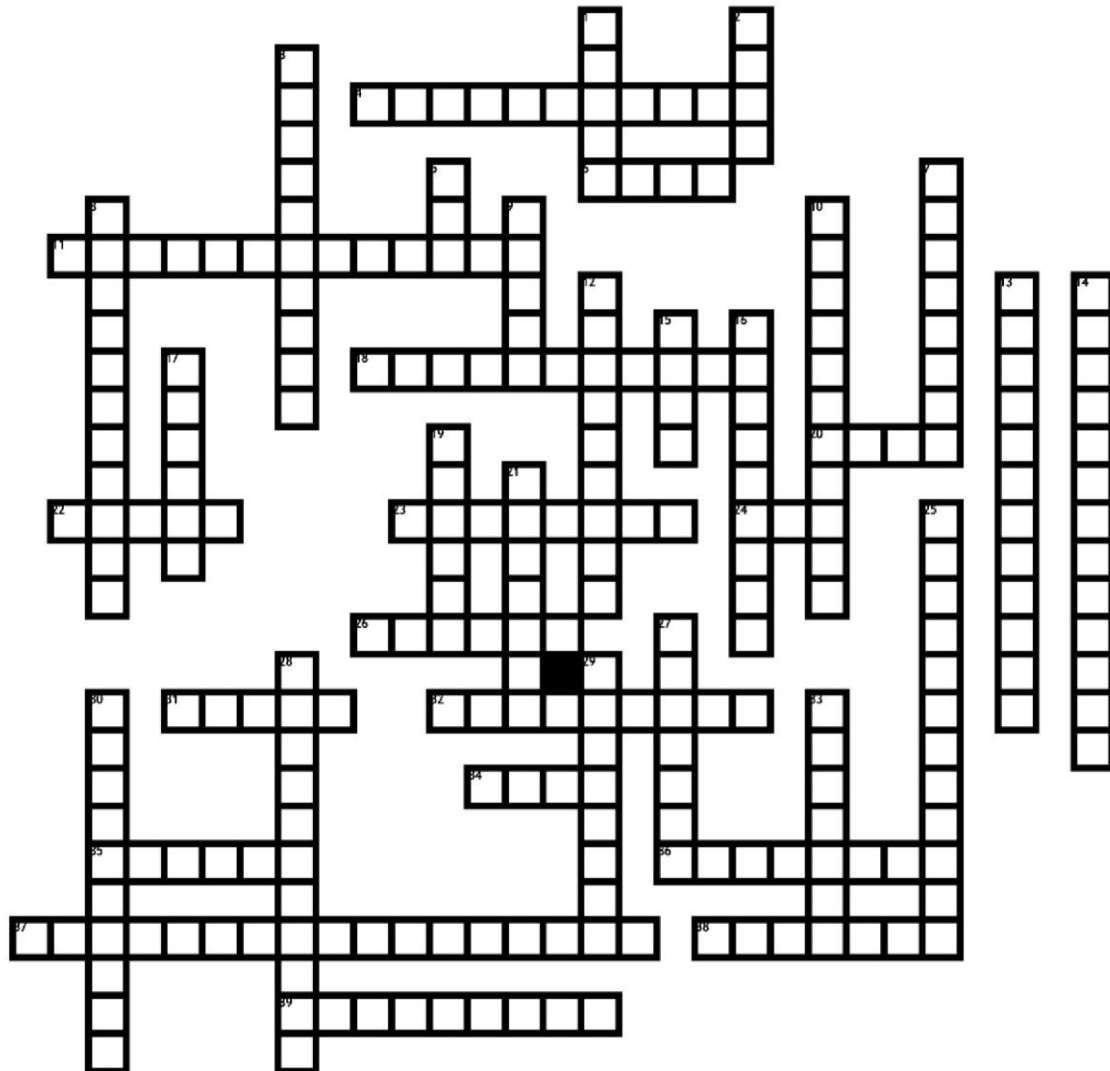
Pharmacology is just as interesting as it is challenging -- the science of drugs; their kinetics and dynamics, and the interaction between their therapeutic and as well, adverse effects.

It may sound all complex and daunting, but soon, you get to seat back and watch how it all start making sense. Lectures would be punctuated by block postings, featuring clinical rotations in the various departments and units of the hospital setting, to meet real patients with real problems. There, against the backdrop of sheer discipline and hands-on participation, you come to hone and appreciate the lifelong clinical skill of hunting for clues and evidences, imploring gathered theoretical knowledge in each of your patient's case, as to arrive at a diagnosis while proffering treatment, and as well, imbibing love, compassion, kindness and a deep understanding of the delicate human condition.

Hopefully by then when the question of "is this really the life you have chosen to live?" would pops up again, you'd beat your chest and say: "yes! this is the life I have been dreaming to live!"

Okeji Chiamaka (Feature Editor I)  
Mokwe Victor (Feature Editor II)

# Medical Terminology



**Across**

- 4. Slow heart rate
- 6. Inflammation
- 11. PRN; 2 words
- 18. Examination of the abdomen with a -----scope
- 20. Suffix meaning hernia/tumor
- 22. Suffix meaning breakdown or separation
- 23. Blood clot under the skin
- 24. Blood group system
- 26. Suffix meaning sagging/ falling out of place
- 31. Large
- 32. Looking at blood vessels with dye
- 34. Root for rib

35. Ovary root

- 36. Root word for cartilage
  - 37. ECG
  - 38. Suffix meaning dilation/stretching
  - 39. BID; 3 words
- Down**
- 1. Root word for skull
  - 2. Blue
  - 3. Commonly known as 'blood poisoning'
  - 5. Abbreviation for the medical term of stroke
  - 7. Without fever
  - 8. Platelet
  - 9. Excessive; too much

10. Removal of a kidney

- 12. Cutting of a tube/vessel
- 13. High blood pressure
- 14. Too much sugar in the blood
- 15. Many; much
- 16. Difficulty eating
- 17. Low RBC count
- 19. Root for lung
- 21. Term for tube
- 25. Under the skin
- 27. Requiring the presence of air
- 28. Red blood cell
- 29. Urination occurring at night
- 30. Deficiency of WBC
- 33. Difficulty breathing

# Okwudili Francis Chukwuani,

B. Phil (Hons), MBBS, FWACS, FRCS, CWSP.  
**Cardiothoracic Surgeon, Ohio, USA.**

In 1978, when he obtained his WASC with distinction, he turned down his admission to read medicine at the UNN, in pursuit of wisdom. In 1983, he obtained an honors degree in philosophy from the Pontifical Urban University Rome; he taught in a high school for one year; and then went back to the UNN, where he graduated in medicine in 1990, as the best student in public health. He was the editor-in-chief of the 1989 edition of MEDIKKA, which was the first edition to have an International Standard Serial Number (ISSN).

He completed residency training in Cardiothoracic and Vascular Surgery at the UNTH, Enugu, before he traveled to the United Kingdom and the United States, in 2001.

He worked as a specialist registrar in vascular surgery at the Charing Cross Hospital London, and at the Queen Elizabeth Hospital, Birmingham.

He also completed fellowship in cardiovascular surgery at the Texas Heart Institute, Houston, USA.

In 2006, while he was at the Texas Heart Institute, he was contacted by the editor-in-chief of MEDIKKA, who was requesting for financial assistance for the journal. Instead of offering a onetime assistance, Dr. Chukwuani initiated a plan for an online version of MEDIKKA, and has on his own, been hosting the online version of MEDIKKA for the past 17 years, since 2006.

He is currently a staff of the Department of Veterans Affairs Medical Center, and of the Cleveland Clinic's Euclid Hospital, Cleveland, Ohio, USA.





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