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Assessment of the Knowledge, Attitude, and Practice of People Living with HIV/AIDS towards COVID-19 in Akwa Ibom State, Nigeria

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Abstract

Effective management of an infectious disease like COVID-19 requires adequate knowledge, positive attitudes, and appropriate practices. This study assessed the knowledge, attitudes, and practices (KAP) regarding COVID-19 among individuals living with HIV/AIDS in Uyo, Akwa-Ibom State, Nigeria. The study was a descriptive cross-sectional survey of the knowledge, attitude, and practice regarding COVID-19 among people living with HIV/AIDS at the ART clinic of St Luke's Hospital Anua Uyo in Akwa Ibom State. Participants were selected using random sampling, and data were collected through a structured questionnaire. Data were analysed using IBM SPSS version 25, with Chi-square statistics performed to determine associations between variables. Statistical significance was set at $p < 0.05$. 121 respondents participated in the study, with 66.1% being female. Most respondents were aged 31-50 (60.4%), married (54.5%), had secondary education (46.3%), and were self-employed (59.5%)—about half (50.4%) resided in urban areas. COVID-19 awareness was universal (100%), though knowledge decreased significantly with age, particularly among those over 60 ($p<0.05$). Married and single respondents exhibited higher awareness compared to divorced, separated, or widowed participants ($p<0.05$), and educated respondents had significantly better knowledge than those with no formal education ($p<0.05$). Urban residents were more knowledgeable than rural dwellers ($p<0.05$). While attitudes towards COVID-19 were generally positive (81.8%), education level was significantly associated with a positive attitude ($p<0.05$). However, practices were poor overall (37.2%), especially among the less educated ($p<0.05$). This study revealed important disparities in knowledge, attitudes, and practices related to COVID-19 among people living with HIV/AIDS in Uyo. These findings emphasize the need for targeted interventions to improve health education and compliance with COVID-19 preventive measures among vulnerable populations.

Keywords: *Akwa-Ibom State, COVID-19, HIV/AIDS, Knowledge, Attitudes, and Practices (KAP), Uyo.*

Introduction

COVID-19, a viral respiratory disease caused by the SARS-CoV-2 virus, has impacted public health worldwide since its emergence in late 2019 [1]. The disease quickly spread globally, leading the World Health Organization to declare a pandemic in March 2020. As of recent data, over 760 million cases have been reported worldwide, with deaths surpassing 6.9 million [2].

In Nigeria, COVID-19 was first reported in February 2020. As of the records, Nigeria has reported over 260,000 cases and around 3,000 deaths, with most cases concentrated in Lagos, Abuja, and other urban centres [3]. While Nigeria's case numbers are relatively lower than

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many other countries, the pandemic still strained its healthcare infrastructure, revealing vulnerabilities in the health system. Akwa Ibom recorded several waves of the virus. Although Akwa Ibom's reported cases were fewer compared to states like Lagos, it saw considerable health and socioeconomic impacts [4].

The state has a projected population of over 5.5 million people, with Uyo as its capital city and a central urban hub [5]. Akwa Ibom has one of Nigeria's highest HIV prevalence rates, estimated at 5.5%, compared to the national average of 1.3%, with an estimated 178,000 people living with HIV/AIDS in the state [6]. In Uyo, a significant number of HIV patients receive treatment at specialized facilities, with several thousand people actively engaged in antiretroviral therapy programs.

However, the COVID-19 pandemic significantly disrupted essential HIV prevention, care and treatment services, particularly in low- and medium-income countries (LMICs), potentially undermining years of progress in the fight against HIV [7]. Apart from the health risk to the people living with HIV (PLHIV), COVID-19 also interrupted critical services, resulting in significant delays in the supply of medications and other health commodities and access to HIV viral load testing required to monitor treatment outcomes. Also, changes in HIV clinics and healthcare personnel's priorities, travel limitations, the lack of commercial and restricted private transportation, and deteriorating socioeconomic conditions all impacted the continuity of essential HIV services [8].

There were concerns about PLHIV's increased risk of severe COVID-19 illness based on the assumption that PLHIV is more likely to be immunosuppressed [9]. Historically, advanced HIV infection has been linked to an increased risk of respiratory illnesses and severe respiratory distress before the advent of effective combination ART [10]. The potential impact of COVID-19 on PLHIV with coexisting comorbidities, such as tuberculosis, is significant. Studies have shown that co-infection with HIV and tuberculosis accelerates the immunopathology of HIV and worsens disease progression, making the timing of ART initiation critical in managing both conditions. This is especially true in LMICs [11].

Consequently, insufficient understanding may result in delayed diagnosis, disease spread, and poor infection control practices [12]. The level of preparedness to curtail outbreaks may influence the level of its control and prevention, suggesting that HIV patients should take necessary preventive action to avoid contracting the COVID-19 virus, which could be fatal. The amount of knowledge about a disease state is related to one's attitude about the disease. These two factors interact to significantly influence the practices and procedures used to control it [13-15]. For example, in a study of medical students' knowledge, beliefs, and behavioural intentions about H1N1 influenza in Pakistan, it was discovered that a lack of awareness and a negative attitude is linked to poor adherence to procedures aimed at limiting the spread of the disease [16]. Additionally, numerous research have demonstrated that accurate information motivates individuals to adhere to health-promoting habits and procedures [17, 18].

Presently, there are a limited number of studies on knowledge and attitudes during epidemics that have been conducted in Nigeria. Nonetheless, lessons learned from studies conducted in other countries during epidemic situations such as the 2003 Severe Acute Respiratory Syndrome (SARS) outbreak indicated that knowledge and attitudes about infectious diseases are associated with extreme panic and other populations' emotional reactions, complicating efforts to prevent disease spread" [19, 20]. Therefore, the study investigated the knowledge, attitudes, and practices of people living with HIV/AIDS regarding COVID-19 in Uyo, Akwa Ibom state.

Specifically, it seeks to assess the levels of knowledge and attitudes within this group, as well as the correlation between sociodemographic factors and these variables. Furthermore, the study explored the extent to which knowledge and attitudes influence preventive practices towards COVID-19 among people living with HIV/AIDS in Uyo, Akwa Ibom State.

Methods

Study Design

This study was a descriptive cross-sectional survey of the knowledge, attitude, and practice of people living with HIV/AIDS (PLHIV) towards COVID-19.

Study Site

The study was conducted among PLHIV receiving comprehensive HIV care and treatment at St Luke's Hospital, Uyo, Akwa Ibom State. St Luke's Hospital is a Catholic Mission Hospital located in Anua Uyo, the Akwa Ibom state capital of South-South Nigeria and serves clients in the capital and beyond.

Study Population

All PLHIV receiving care at St Luke's Hospital Anua Uyo, Akwa Ibom, were selected for this survey through simple random sampling to evaluate their knowledge, attitudes, and practices regarding COVID-19. Participants were categorized into two groups: males and females.

Sample and Sampling Techniques

The sample size was calculated based on the acceptable level of significance, power of the study, expected effect size, underlying event rate in the population, and standard deviation. The sampling technique that was adopted for this study was a simple random sampling technique.

Sample Size Determination

The sample size for this study was estimated using the formula [21, 22].

$$n = N\frac{\frac{Z^2 x\ P\ (1-P)}{e^2}}{N-1+\frac{Z^2 x\ P\ (1-P)}{e^2}}.$$

n=3470, Z = $1.96^2, P = 0.056, P = 0.944, e^2 = 0.05^2$.

$$\frac{\frac{3470\ \times\ 1.96^2 \times\ 0.056\ \times 0.944}{0.05^2}}{N-1+\frac{3470 \times 1.96^2 \times 0.056 \times 0.944}{0.05^2}}$$

$$= \frac{3470 \times 81.23}{3469+81.23} = \frac{281868.1}{3550.23} = 79.4.$$

For a population below 10,000

N=79.

$$nf = \frac{n}{(1+(n/n)}.$$

$$nf = \frac{79}{1+(\frac{79}{3470})} = \frac{79}{1+0.023} = \frac{79}{1.023} = 77.$$

10% attrition added will be = 0.1 x 77 = 7.8 = 8.

77 +8 = 85.

Therefore, the minimum number of respondents was 85.

Data Analysis

Data were analyzed using IBM SPSS version 25 and Microsoft Excel version 2019. Descriptive analysis was done for variables, and the outcomes were presented as frequencies and percentages. In addition, Chi-square statistics were performed to establish the significant association between variables, and p values < 0.05 were considered significant.

Ethical Consideration/Informed Consent

The study received approval with the approval number AKHREC5/7/21/06 from the Research and Ethics Committee of the Akwa Ibom State Ministry of Health before data collection. Participants were asked to voluntarily sign consent forms to confirm their willingness to participate in the survey.

Result and Discussion

Sociodemographic Characteristics of the Respondents

The study comprised 121 respondents, of whom 80 (66.1%) were females. Most of the respondents were within 31 – 40 (36.4%). Most of them were married (54.5%), 46.3% attained secondary education, and 6.6% were uneducated. Almost three-fifths (59.5%) were self-employed, while 16.9% and 9.9% were unemployed and students. Most of them were on ART (96.7%); 50.4% lived in urban areas, 16.5% lived in peri-urban, and 33.1% lived in rural areas as shown in Table 1.

Table 1. Sociodemographic Characteristics of the Respondents

Parameter	Response	Frequency (n=121)	Percentage
Gender	Male	41	33.9
	Female	80	66.1
Age category	21 – 30	28	23.1
	31 – 40	44	36.4
	41 – 50	29	24.0
	51 – 60	13	10.7
	Above 60	7	5.8
Marital status	Single	32	26.4
	Married	66	54.5
	Divorced/separated/widowed	23	19.0
Level of Education	No formal education	8	6.6
	Primary	26	21.5
	Secondary	56	46.3
	Post-Secondary	31	25.6
Employment	Gainfully employed	17	14.0
	Self-employed	72	59.5
	Student	12	9.9
	Unemployed	20	16.5
Religion	Christianity	119	98.3
	Traditional	2	1.7
Residence	Rural	40	33.1
	Peri-Urban	20	16.5
	Urban	61	50.4
On ART	Yes	117	96.7
	No	4	3.3

Knowledge of Persons Living with HIV/AIDS Towards COVID-19

The study found that overall knowledge of COVID-19 among PLHIV was high, with an average score of 89.3%. All (100.0%) were aware of COVID-19, and 83.5% demonstrated knowledge of its symptoms including fever, fatigue, dry cough, shortness of breath, and body aches. Similarly, 83.5% were aware of the modes of transmission that is via respiratory droplets from infected individuals, 84.3% knew that there was no effective cure, and 78.5% were aware that not everybody with COVID-19 would develop complications. Concerning preventive measures, 95.0% were aware that washing hands with soap and water and

wearing face masks (94.2%) prevent the spread of the disease. The knowledge of preventing the disease through isolation and vaccines was 88.0% and 73.6%, respectively (Table 2).

Table 2. Knowledge of COVID-19 Among PLHIV in Uyo Akwa Ibom State

Parameter	**Frequency (n=121)**	**Percentage**
Aware of COVID-19	121	100.0
The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, shortness of breath, and body aches	101	83.5
COVID-19 virus spreads via respiratory droplets of infected individuals	101	83.5
There is currently no effective cure for COVID-19, but early symptomatic and supportive treatment can help most patients recover from the infection	102	84.3
Not all persons with COVID-19 will develop severe cases. Only those who are elderly and have Chronic illnesses are more likely to be severe cases	95	78.5
Washing hands frequently with soap and water for at least 20 seconds or using an alcohol-based hand Sanitiser is essential to prevent infection with COVID-19	115	95.0
Ordinarily, residents can wear face masks to prevent infection by the COVID-19 virus	114	94.2
Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus	107	88.0
There is a vaccine to protect humans from contracting COVID-19	89	73.6
General knowledge	108	89.3

Association of Sociodemographic Distribution of Knowledge of COVID-19 Among PLHIV

As shown in Table 3, there was no significant difference between male and female awareness of COVID-19. However, a slightly higher proportion of males (90.0%) were aware of the disease than their female counterparts (87.8%) ($p>0.05$). Awareness of COVID-19 decreased with an increase in age from 100% among 21-30 years, 90.0% among 31 – 40, and 57.1% among respondents older than 60. Both married (92.4%) and single (93.8%) respondents were more aware of COVID-19 than the divorced/separated/widowed (73.9%) ($p<0.05$). Educated respondents were more aware (100% - post-secondary, 98.2% - secondary) than uneducated respondents (25.0%) ($p<0.05$). Likewise, respondents living in urban (96.7%) and peri-urban (95.0%) had better knowledge of COVID-19 than the ones

living in rural areas (75.0%) ($p<0.05$). No significant association was observed between religion, employment, and knowledge of COVID-19 among the study respondents ($p>0.05$).

Table 3. Sociodemographic Distribution of Knowledge of COVID-19 Among PLHIV

Characteristics	**Response**	**Overall knowledge of COVID-19**			
		Poor (<70%)	**Good (≥70%)**	**X^2**	**P-value**
Gender	Male	5 (12.2)	36 (87.8)	0.136	0.712
	Female	8 (10.0)	72 (90.0)		
Age category	21 – 30	0 (0.0)	28 (100.0)	13.090	0.011*
	31 – 40	4 (9.1)	40 (90.0)		
	41 – 50	3 (10.3)	28 (89.7)		
	51 – 60	3 (42.9)	10 (76.9)		
	Above 60	3 (42.9)	4 (57.1)		
Marital status	Married	5 (7.6)	61 (92.4)	7.011	<0.030*
	Single	2 (6.3)	30 (93.8)		
	Divorced/separated/widowed	6 (26.1)	17 (73.9)		
Level of education	No formal education	8 (75.0)	2 (25.0)	46.987	<0.001*
	Primary	6 (23.1)	20 (76.9)		
	Secondary	1 (1.8)	55 (98.2)		
	Post-Secondary	0 (0.0)	31 (100.0)		
Religion	Christianity	12 (10.1)	107 (89.9)	3.268	0.071
	Traditional	1 (50.0)	1 (50.0)		
Employment	Gainfully employed	0 (0.0)	17 (100.0)	4.611	0.203
	Self-employed	10 (13.9)	62 (86.1)		
	Student	0 (0.0)	12 (100.0)		
	Unemployed	3 (15.0)	17 (85.0)		
Residence	Rural	10 (25.0)	30 (75.0)	12.711	0.002*
	Peri-Urban	1 (5.0)	19 (95.0)		
	Urban	2 (3.3)	59 (96.7)		

Sources of Information About COVID-19

Figure 1 shows the various sources of information about COVID-19 among PLHIV attending St Luke's Hospital Anua Uyo in Akwa Ibom State. The majority (40.5%) heard about COVID-19 from radio, 8.3% from friends, 5.0% from television, and 42.1% heard from multiple sources.

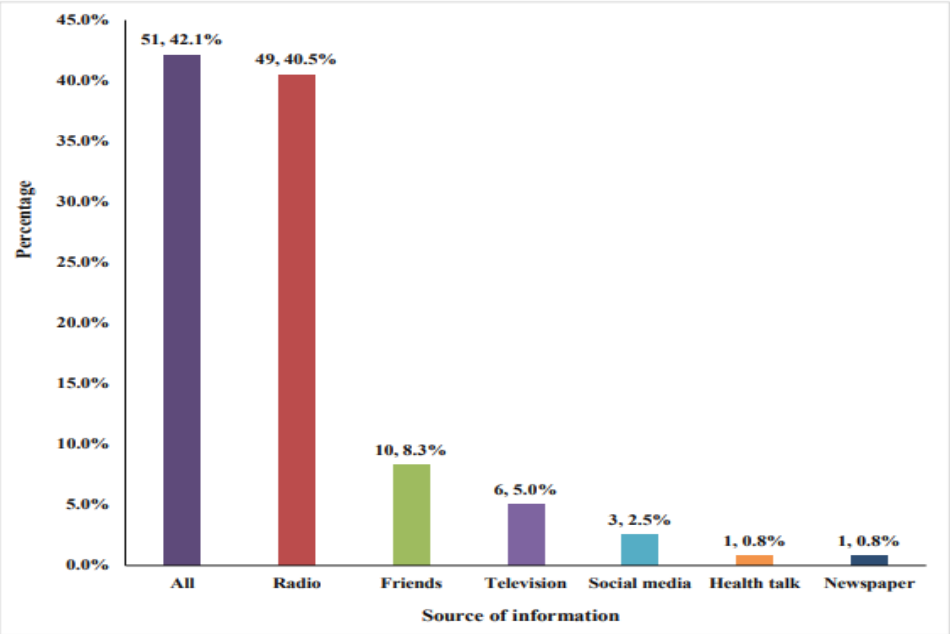

Figure 1. Sources of Information About COVID-19

Attitudes of Persons Living with HIV/AIDS Towards COVID-19

The respondents showed a generally positive attitude towards COVID-19 (81.8%). Most respondents in this study (81.8%) agreed that PLHIV is at risk of COVID-19; 83.5% knew that the disease is not for the rich only. Also, 91.7% agreed that it is crucial to report any suspected cases of the disease to health authorities, and 81.0% were willing to take the test if symptomatic. Furthermore, 90.9% agreed to be isolated in the hospital if they tested positive for the disease, and 66.9% decided to take the vaccine if made available to them. Also, 64.5% did not believe that COVID-19 is a satanic mark of the beast.

Table 4. Respondents' Attitudes Towards COVID-19

Parameter	Correct response	Frequency (n=121)	Percentage
A Person living with HIV is at risk of COVID-19	Agree	99	81.8
COVID-19 is a disease for only the rich	Disagree	101	83.5
It is crucial to report a suspected case to health authorities	Agree	111	91.7
Are you willing to take a test for COVID-19 if symptomatic	Yes	98	81.0
If you were tested positive for COVID-19, would you prefer to be isolated in the house or hospital for medical care	Hospital/isolating centre	109	90.1
If the COVID-19 Vaccine is made available to you, are you willing to take it	Yes	81	66.9

Do you think COVID-19 Vaccine is a satanic Mark of the beast	Disagree	78	64.5
General attitude	Positive	99	81.8

Association of Sociodemographic Distribution of Attitudes Towards COVID-19 Among PLHIV

As shown in Table 5, All respondents, both males (82.9.%) and females (81.3%), showed similar positive attitudes towards COVID-19 (p>0.05). Age, marital status, employment, religion, and place of residence were not significantly associated with respondent's attitudes towards COVID-19 (P>0.05). However, educated respondents had a more positive attitude toward the disease (100% - post-secondary, 83.9.% - secondary) than uneducated respondents (50.0%) (p<0.05). Similarly, respondents with good knowledge of COVID-19 (88.0%) showed a positive attitude towards the disease than those with inadequate knowledge (30.8%) (p<0.05).

Table 5. Sociodemographic Distribution of Attitudes Towards COVID-19 Among PLHIV

Characteristics	**Response**	**Overall attitudes towards COVID-19**			
		Negative	**Positive**	**X^2**	**P-value**
Gender	Male	7 (17.1)	34 (82.9)	0.051	0.821
	Female	15 (18.8)	65 (81.3)		
Age category	21 – 30	4 (14.3)	24 (85.7)	4.916	0.296
	31 – 40	7 (15.9)	37 (84.1)		
	41 – 50	4 (13.8)	25 (86.2)		
	51 – 60	6 (38.5)	8 (61.5)		
	Above 60	2 (28.6)	5 (71.4)		
Marital status	Married	8 (12.1)	58 (87.9)	4.244	0.120
	Single	7 (21.9)	25 (78.1)		
	Divorced/separated /widowed	7 (30.4)	16 (69.6)		
Level of education	No formal education	4 (50.0)	4 (50.0)	17.221	0.001*
	Primary	9 (34.6)	17 (65.4)		
	Secondary	9 (16.1)	47 (83.9)		
	Post-Secondary	0 (0.0)	31 (100.0)		
Religion	Christianity	21 (17.6)	98 (82.4)	1.384	0.239
	Traditional	1 (50.0)	1 (50.0)		
Employment	Gainfully employed	1 (5.9)	16 (94.1)	6.315	0.097
	Self-employed	13 (18.1)	59 (81.9)		
	Student	1 (8.3)	11 (91.7)		
	Unemployed	7 (35.0)	13 (65.0)		
Residence	Rural	12 (30.0)	28 (70.0)	5.736	0.057
	Peri-Urban	3 (15.0)	17 (85.0)		

	Urban	7 (11.5)	54 (88.5)		
Knowledge of COVID-19	Good	13 (12.0)	95 (88.0)	25.515	<0.001*
	Poor	9 (69.2)	4 (30.8)		

Practices of Persons Living with HIV/AIDS Towards COVID-19

The respondents showed widespread poor practices (37.2%) towards COVID-19. Although most respondents practised proper handwashing (86.8%), did not reuse a cloth face mask without washing (86.0%), there was low use of face masks (47.1%), only a few did not touch their eyes, nose, and mouth frequently with unwashed hands (37.2%), and just 38.0% did not go to gatherings without using a face mask. Furthermore, less than half (48.8%) maintained physical distancing, and 57.9% cleaned and disinfected touched objects and surfaces frequently. Respondents who obey government rules regarding COVID-19 were 44.6%, and none of the respondents took the COVID-19 Vaccine.

Table 6. Practices of Persons Living with HIV/AIDS Towards COVID-19

Parameter	**Correct response**	**Frequency (n=121)**	**Percentage**
Do you practice proper hand hygiene by frequently washing your hands and using hand sanitizer	Yes	105	86.8
Do you wear a face mask when leaving home	Yes	57	47.1
Do you reuse a cloth face mask without washing it	No	104	86.0
Do you touch your eyes, nose, and mouth frequently with unwashed hands	No	45	37.2
Do you maintain a physical distance of at least one meter	Yes	59	48.8
Do you clean and disinfect frequently touched objects and surfaces	Yes	70	57.9
Do you participate in meetings, religious activities, events, and other social gatherings or any crowded Place without a facemask or physical distancing	No	46	38.0
Do you obey all government rules related to the COVID-19	Yes	54	44.6
Have you taken COVID-19 Vaccine	Yes	0	0 (0.0)
General Practices	Good	45	37.2

Association of Sociodemographic Distribution of Practices of PLHIV towards COVID-19

The general preventive practice towards COVID-19 was not significantly different between males and females, age, marital status, religion, and place of residence ($p>0.05$). However, uneducated respondents (secondary-25.0, primary-26.9%, and no education 12.5%) showed significantly poorer Practices than post-secondary education (74.2%) ($p<0.05$). Similarly, there were overall good preventive practices among students (66.7%) and gainfully employed respondents (58.8%) than unemployed (25.0%) ($p<0.05$), as shown in Table 7.

Table 7. Sociodemographic Distribution of Practices of PLHIV Towards COVID-19

Characteristics	Response	Overall Practices towards COVID-19			
		Poor	Good	X^2	P-value
Gender	Male	25 (61.0)	16 (39.0)	0.089	0.765
	Female	51 (63.7)	29 (36.3)		
Age category	21 – 30	16 (57.1)	12 (42.9)	2.239	0.692
	31 – 40	27 (61.4)	17 (38.6)		
	41 – 50	21 (72.4)	8 (27.6)		
	51 – 60	7 (53.8)	6 (46.2)		
	Above 60	5 (71.4)	2 (28.6)		
Marital status	Married	43 (65.2)	23 (34.8)	0.354	0.838
	Single	19 (59.4)	13 (40.6)		
	Divorced/separated/ widowed	14 (60.9)	9 (39.1)		
Level of education	No formal education	7 (87.5)	1 (12.5)	24.995	<0.001*
	Primary	19 (73.1)	7 (26.9)		
	Secondary	42 (75.0)	14 (25.0)		
	Post-Secondary	8 (25.8)	23 (74.2)		
Religion	Christianity	84 (62.2)	45 (37.8)	1.204	0.273
	Traditional	2 (100.0)	0 (0.0)		
Employment	Gainfully employed	7 (41.2)	10 (58.8)	10.499	0.015*
	Self-employed	50 (69.4)	22 (30.6)		
	Student	4 (33.3)	8 (66.7)		
	Unemployed	15 (75.0)	5 (25.0)		
Residence	Rural	28 (70.0)	12 (30.0)	1.329	0.515
	Peri-Urban	12 (60.0)	8 (40.0)		
	Urban	36 (59.0)	25 (41.0)		

Discussion

The majority of respondents in this study displayed good knowledge of COVID-19 (89.3%). The factors associated with knowledge of COVID-19 among the respondents include age, marital status, education, and place of residence. However, gender, religion, and employment status of PLHIV were not significantly associated with knowledge of COVID-19. A similar high knowledge of COVID-19 has been reported in

several studies in Nigeria [13, 23-25] and in several other countries [18, 23, 25-36].

Most of the study participants (72%) had a minimum of secondary education, indicating a high level of exposure to information. In this study, educated respondents were more aware of the disease than the uneducated ones. These findings could be due to the continual reporting and availability of information on television, the internet, government websites, social media and newspapers during a pandemic situation. Educated people could have actively learned about the disease through various sources of information, including reading from the internet and newspapers [36]. Similar studies conducted in Enugu, Nigeria, and India also showed that educated participants had a better knowledge of COVID-19 than the less educated [23, 25]. Another related study in Iran indicated that the educated participants had a good understanding of COVID-19 compared to the uneducated ones [33]. Therefore, it is necessary to enlighten PLHIV about the COVID-19 epidemic because they are among the most vulnerable groups. A previous study has reported that people with lower levels of education or uneducated ones had less knowledge of COVID-19, making them vulnerable to the epidemic because of their inability to understand the information dished out through mass media and other sources [37].

This study also found that place of residence is a significant determinant of COVID-19 awareness. PLHIV residing in urban areas were more aware of COVID-19 than those in rural areas. This finding might be due to the availability of infrastructure and exposure to information that enhances the knowledge of urban residents on the pandemic. Similar to this finding, several studies have reported a significantly better knowledge of COVID-19 among urban residents, probably because they are more educated or have access to unlimited COVID-19-related information from several sources than rural dwellers [18, 23, 38-40]. The inadequate knowledge of COVID-19 found among PLHIV in rural areas in this study may also result from not having access to professional or medical personnel and various intervention programs to enlighten them on the risk and preventive practices of COVID-19. In addition, the constraints could be a result of the distance of rural dwellers to health care centres or the absence of modern health facilities. A study has demonstrated that those who acquire knowledge about a disease condition from informal sources such as friends and relatives are less likely to be informed than those who obtain information from professional or modern medical institutions [41]. Studies have also shown that health promotional information provided by public health programs to stop and control pandemics must be founded on scientific data and accessible to the public in language easily understood by the masses to raise public awareness [42].

Furthermore, this study showed that poor or good knowledge might be affected by the level of access to mass media or social media. COVID-19 and HIV/AIDS knowledge has been acquired through various methods, with different social media platforms and the internet serving as critical sources of information about these unique diseases [43, 44, 30, 45]. Several studies have also emphasized mass media as a critical tool for disseminating information to the general public [23, 38, 46, 25].

The majority of respondents in this study displayed positive attitudes towards COVID-19 (81.8%), irrespective of sociodemographic characteristics (age, marital status, and residence) except education attainment. The positive attitude found in this study corresponds to the previous reports from surveys in Nigeria and other countries [30, 13, 32, 23, 25, 18, 36]. The findings of this study showed a significant association between attitude towards COVID-19 and education attainment. Most respondents with secondary or higher education (>93%) showed positive attitudes towards the disease than their counterparts with primary or no

formal education. This finding might be due to the high level of awareness of COVID-19 among the study respondents, similar to previous reports [21, 33, 36, 47].

The present study found that most respondents agreed that they were vulnerable to COVID-19 and that the disease is not for the rich alone or a mark of the beast. Similarly, most of them were willing to take COVID-19 tests and were ready to be isolated in the hospital if they tested positive. Besides, they were ready and willing to be vaccinated against the disease. This positive attitude might be connected to the availability of information from diverse sources, similar to reports in previous studies on knowledge, attitudes, and practices towards COVID-19 [22, 48-53].

Despite the study respondents' knowledge and positive attitudes towards COVID-19, most of them displayed poor preventive practices towards the disease. For example, the study showed that only 37.2% exhibited a good understanding of preventive practices towards the disease. In addition, most respondents participated in gatherings or crowded places without face masks, did not practice social distancing, frequently touched their eyes with unwashed hands, and primarily did not obey government rules related to COVID-19 prevention practices. As a result, the proportion of respondents that engaged in preventive practices in this study is lower than 68.8% in a study conducted in the USA [54], and 89% in Iran [33]. Poor preventive practices found in this study do not agree with the previous submission that individuals aware of COVID-19 are more likely to display good preventive practices [38, 15]. It has also been shown that knowledge of disease reduces the possibility of being infected through improved preventive practices [38, 55]. In addition, good preventive practices were more prevalent among educated and gainfully employed respondents than the uneducated and unemployed ones. However, preventive practices were not influenced by sex, age, religion, and place of residence. These findings align with previous studies' results that found a significant association between preventive strategies and education and employment status [32, 50, 38, 36]. Furthermore, this study did not find any significant association between gender and good preventive practices, unlike some previous reports that females are more likely to show positive preventive practices than males [56, 38, 57, 58]. However, a systematic review of several studies found a significant association between practices and several factors, including “education, occupation, income, gender, age, residence, work experience, religion, having media, marital status, and race” [32], indicating that the association between preventive practices and sociodemographic factors varies with study and location.

Conclusion

The majority of respondents in this study were knowledgeable about COVID-19. However, the knowledge of the disease was influenced by several factors, including respondents’ age, marital status, education, and place of residence. In contrast, gender, religion, and employment status of PLHIV were not significantly associated with knowledge of COVID-19. Most of the study respondents also displayed positive attitudes towards COVID-19, particularly the educated ones. Despite the excellent knowledge and positive attitudes towards COVID-19, most of the study respondents displayed poor preventive practices towards the disease.

Recommendations

Given the poor preventive practices observed among most respondents, the government and health sector stakeholders should implement programs aimed at enhancing preventive behaviours among PLHIV. Secondly, ensuring uninterrupted access to healthcare services for PLHIV during a pandemic is crucial to prevent the spread of

HIV, which remains a significant health threat alongside COVID-19. Additionally, targeted efforts are needed to protect PLHIV from COVID-19 infection due to their heightened vulnerability to COVID-19-related complications and fatalities.

Conflict of Interest

The authors declare that they have no conflicts of interest related to this manuscript.

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