

EXPOSURE TO INFORMATION, KNOWLEDGE, PERCEPTION, AND PRACTICES TOWARDS COVID-19 AMONG PEOPLE LIVING WITH HIV/AIDS IN ABIA STATE, NIGERIA

Chidiebere A. NWACHUKWU

Department of Mass Communication, University of Nigeria, Nsukka, Enugu State
chidiebere.nwachukwu@unn.edu.ng

ORCID: 0000 0001 5634 2526

Abstract

Every person is at risk of contracting COVID-19, but people living with HIV/AIDS (PLWHA), because of their weakened immune systems, stand a greater risk of contracting the disease and are likely to suffer more severe symptoms relative to people without such underlying diseases. Governments, international agencies, and non-governmental organisations have employed mainstream media, social media, and interpersonal channels extensively to educate the masses on the need to adopt effective safety protocols in the face of a lack of cure and vaccines that offer permanent protection from the disease. This study examined information sources as well as knowledge, perception, and practices toward COVID-19 among PLWHA in Abia State. The study adopted a survey research design and used the purposive sampling technique in the sample selection, whereas the questionnaire was used as the instrument for data collection. The findings showed that more than 90% of the respondents were exposed to information on COVID-19 with family/friends, healthcare workers, and radio as the most common sources of information, while healthcare workers were the most trusted. Further analysis indicated a high level of knowledge of COVID-19 among PLWHA in Abia State, a lower perception of their own vulnerability, and moderate adherence to safety measures.

Keywords: Behaviour, COVID-19, Disease, Information, Pandemic, Media

INTRODUCTION

The global community was blindsided in late 2019 when a strange viral disease named coronavirus 2019 (COVID-19) emerged with startling morbidity and mortality rates. The situation was not helped by the unavailability of both a cure and a vaccine that could offer permanent protection. One of the facts that emerged early on was that the elderly and people with underlying diseases were especially susceptible to the disease and, when infected, were more likely to experience severe symptoms and complications (Bashir et al., 2021; Sanyaolu et al., 2020). Due to their weakened immune system, people living with HIV/AIDS, more especially those with co-morbidities, are vulnerable to COVID-19 and the

attendant severe complications (Ejaz et al., 2020; Waterfield et al., 2021). With the world confronting COVID-19 with neither a cure nor a vaccine in the early days of the pandemic, governments and agencies the world over leveraged the mass media and interpersonal channels to promote behaviour change involving adherence to certain protective measures that were found effective and crucial in controlling the disease.

The combination of the mainstream media and social media is always an important source of information (Edogor, Jonah & Ojo, 2015) during public health emergencies. Several studies have identified the social media (Huang et al., 2021), mainstream media including radio, television, newspapers and magazines (Adams, et. al., 2023; Papagiannis, Malli, Raptis, et al, 2020; Kigatiira, 2020; Olapegba, Ayandele, et al, 2020; Serwaa, Lamptey, Appiah, et al, 2020; Mahmood, Hussain, Mahmood, et al, 2020; Kirschke, 2024), billboards/infographics ((Mohamadpour et al, 2024) in addition to family and friends (Erinoso et al., 2021; Wu et al., 2022; Zhang et al., 2024) as vital sources of information on COVID-19 in many study locations.

While there may be a surfeit of health information, the degree to which they are accessed and adhered to may depend on how much the population trusts the sources of such information. Studies indicate that health workers (Kalichman et al, 2021), public broadcasting services (Adam et al, 2023), and printed newspapers (Kirschke, 2024) are the most trusted sources of COVID-19 information. The importance of health information dissemination lies in its ability to positively affect knowledge and perception, which can also impact behaviour change. This is why it has become necessary to assess the knowledge, attitude, perception, and preventive practices adopted by people living with HIV/AIDS (PLWHA) in Abia State. Such a group of people ought to know about a serious pandemic, such as COVID-19, as contracting it would complicate their already frail health condition. So, this study sought to ascertain the level of knowledge of COVID-19 among people living with HIV/AIDS in Abia State. It examined their sources of information about the pandemic and the measures they applied to avoid contracting it. There are no specific empirical studies conducted on this current study in the state, which prompted this investigation assessing the attitudes to disease prevention and the factors shaping health decisions among the PLWHA.

Review of Related Literature

Health information, especially through the mass media, has been linked with increased awareness and knowledge of COVID-19 among different populations (Mahmood et al, 2020; Olapegba et al, 2020; Barua et al., 2020). The literature

indicates variations in knowledge of COVID-19 across different demographics. Njingu et al (2021); Callaghan et. al. (2021), and Sun et. al. (2022) report higher knowledge of COVID-19 among urban residents, just as Lawal et al. (2022) in a study in Nigeria found artisans exhibiting good knowledge of COVID-19.

Furthermore, exposure to health information can positively impact perception (Li & Zhong, 2022). Perception is an important determinant of health behaviour (Narayana et al, 2020; Schmalzle et al, 2017). Some studies (Harper et al, 2020; Vanherle et al, 2023; Li & Zhong, 2022) found positive association between risk perception and adherence to COVID-19 preventive behaviour. A study in Ogun State, Nigeria (Daniel et al, 2021) reports moderate knowledge and poor perception of COVID-19 among the respondents, while another study (Le et al, 2023) found a significant association between knowledge and practice as well as between perception and practice. However, there could sometimes be a gap between perceived severity and personal risk perception.

The ultimate goal is to leverage such knowledge to achieve behaviour change that would result in population-wide adoption of preventive measures that would protect the population against COVID-19 infections. Unfortunately, there has not been a wholesale adoption of the preventive measures. For instance, one would expect people with underlying health conditions to diligently adhere to COVID-19 safety protocols in view of the danger it poses to them, but studies show that has not completely been the case. This is not to say that people with underlying health conditions generally reject the preventive measures. On the contrary, some studies indicate adherence to the preventive measures by some with such underlying health conditions (Kaso et al, 2021; Matias et al, 2021; Oliveira et al, 2021; Iradukunda et al., 2021; Shallangwa et. al., 2022).

However, other studies report poor compliance with COVID-19 preventive measures among people with underlying health conditions. Folayan et al (2022), for instance, found that PLWHIV in Nigeria were less likely to adhere to COVID-19 preventive measures relative to people not living with HIV. Similarly, among PLWHA in Rwanda, the level of knowledge about COVID-19 was high, with 97% of participants obtaining a high knowledge score. However, a quarter of participants had poor attitudes toward COVID-19, highlighting the need for targeted interventions to address attitudes and practices related to COVID-19 prevention in this population (Iradukunda et al., 2021; Ly et. al., 2023; Ssetongo et. al., 2021). Wolf et al (2020) also found in a study in the United States that, despite perceiving the seriousness of COVID-19 infection, many of the respondents did not engage in the required behaviour change to protect themselves. Another study in Ethiopia (Taye et al, 2020) found that only a little over 10% of the respondents with hypertension and diabetes mellitus reported

good COVID-19 prevention practices. This poor attitude to health measures is not restricted to COVID-19 only, but is equally reported among people with chronic diseases with respect to adherence to doctors' dietary and medical recommendations. For instance, during the COVID-19 pandemic, when hypertensive and diabetic patients ought to diligently follow their doctors' recommendations, Shimels et al (2021) and Asheq et al (2021) found that in Ethiopia and the United Arab Emirates, respectively, such patients did not adhere to medication as required. Similarly, Mekonnen et al (2021) found that many diabetic patients failed to adhere to dietary recommendations even in the face of COVID-19 risks.

There is sometimes a gap between knowledge of COVID-19 and its negative impact on health and life, and the practical adoption of measures that could protect people from infection. Some demographic and psychographic factors can help explain this phenomenon. Fridman et al (2020), for instance, found that those who trust Government sources are more likely to practice social distancing than those who do not trust such sources. In the same vein, Kaso et al (2021) found that those who strictly follow Government directions and believe in the efficacy of the preventive measures were positively associated with higher odds of adopting COVID-19 preventive measures than those who did not. However, Chen et. al. (2021) and Iheanacho et.al. (2021) identified health workers as reliable and authoritative sources of information on COVID-19, while Stolzenberg et.al. (2023) found that trust for health care workers declined during the pandemic.

In addition, education has been found to impact adherence to COVID-19 preventive measures. Matias et al (2021), Waterfield et. al. (2021), and Ditekemena et al (2021) found that those with higher education are more likely to adhere to the COVID-19 safety protocols. Age and sex also affect adherence to the control measures. A good number of studies found that females are more likely to comply with the safety measures than males (Iradukunda et. al., 2020; Peng et al, 2020; Ipinnimo et al, 2021; Clark, Davila, Regis, and Kraus, 2020). Similarly, some studies indicate that older folks are more likely to comply with the safety measures than younger people (Matias et al, 2021; Villela et al, 2021; Kim & Bayun, 2024; Di Novi et. al., 2022). There are, nevertheless, other studies that have found age does not influence adherence to preventive measures (Li et al, 2020; Azlan et al, 2020). Also, the inconveniences of wearing a mask are seen as a factor that influenced the adoption of preventive measures during the pandemic (Ogunsola et. al., 2023; Aloni-Zarrouk et. al., 2020; Matusiak et al., 2020)

While many studies have interrogated the association between exposure to health information and adherence to COVID-19 preventive measures in many parts of the world, very little has been done on how health information has influenced adherence to the promoted safety protocols among people living with HIV in Abia State, Nigeria. This is the gap this study seeks to fill.

METHODOLOGY

The study adopted the survey research design to examine the views of people living with HIV/AIDS (PLWHA) in Abia State. According to the Abia State Agency for the Control of AIDS (ABSACA), as cited by Chibuike (2025), 46,788 persons are currently living with HIV/AIDS in the state. From the population, the researcher adopted 300 as the sample size using Comrey and Lee's (1992) suggestion, noting as follows pertaining to sample size adequacy: 50–very poor, 100–poor, 200–fair, 300–good, 500–very good, and 1,000+–excellent. Owing to the nature of the study, the researcher applied a purposive sampling technique in the selection of a sample of 300 respondents by means of a 26-item, 4-point Likert Scale questionnaire. The questionnaire has the following guiding statements: Strongly agree, Agree, Disagree, and Strongly Disagree. The instrument was administered to the respondents across five health facilities in the state with the help of the case managers of the PLWHA.

The study made use of exposure to health information as the independent variable while knowledge, perception, and practices were the dependent variables. In addition, the study used gender, age, marital status, occupation, income level, and place of residence as the explanatory variables. Out of the 300 copies of the questionnaire administered, 289 were retrieved and found usable for analysis. The data collected for the study were analyzed using descriptive statistical methods, frequencies and percentages, mean and standard deviation, while statistical tests of significance were conducted using the Chi-square measure of association at a 0.05 level of significance.

Results

Socio-Demographics Characteristics of the Respondents

The summary of the socio-demographic characteristics of the respondents are presented in Table 1 below:

Table 1: Socio-Demographic Characteristics of Respondents

Demographic Variables		Frequency	Percent	Cumulative Percent
Gender	Male	117	40.5	40.5
	Female	172	59.5	100.0
Age	18-35 years	82	28.5	28.5
	36-55 years	176	61.1	89.6
	56 years & above	30	10.4	10.4
Educational qualification	No formal education	45	15.6	15.6
	Primary education	63	21.8	37.4
	Secondary education	103	35.6	73.0
	Tertiary education	78	27.0	100.0
Marital status	Single	45	15.6	15.6
	Married	181	62.6	78.2
	Divorced/Separated	25	8.7	86.9
Occupation	Widowed	38	13.2	100.0
	Unemployed	28	9.7	9.7
	Student	30	10.4	20.1
	Farmer	59	20.4	40.5
	Civil Servant	84	29.1	69.6
	Trader	68	23.5	93.1
	Artisan	20	6.9	100.0
Income level	Less than #30,000	145	50.2	50.2
	#30,000-#59,000	111	38.4	88.6
	#60,000-#99,000	26	9.0	97.4
	#100,000 and above	7	2.4	100.0
Place of residence	Rural	117	40.5	40.5
	Urban	172	59.5	100.0

Exposure to Information on COVID-19

The level of the respondents' (PLWHA) exposure to information on COVID-19 is summarized in Table 2. The results in the table show that 91.0% of the PLWHA agreed (23.9%) or strongly agreed (67.1%) to being exposed to information on COVID-19, while 83.7% received information on COVID-19 almost every day. These results indicate a high level of exposure of the PLWHA to information on COVID-19. The influence of the respondents' places of residence (urban and rural) on their level of exposure to information on COVID-19 was analyzed using

the Chi-square test of independence at a 0.05 level of significance, and the results are presented in Table 3. The Chi-square value of 270.545 has a p-value of 0.00, which is less than the 0.05 level of significance ($p < 0.05$), indicating that the PLWHA level of exposure to information on COVID-19 significantly depended on their places of residence. Also, the Chi-square value of 15.472 has a p-value of 0.017, which is less than 0.05 ($p < 0.05$), showing that the regularity of PLWHA's receipt of information on COVID-19 was significantly influenced by their places of residence. Basically, the respondents in the urban areas were more exposed to information on COVID-19 and received the information more regularly than those in the rural areas.

Table 2: Level of Exposure of PLWHA to Information on COVID-19

Level of Exposure		Frequency	Percent	Cumulative Percent
I was exposed to health information on COVID-19	Strongly Disagree	15	5.2	5.2
	Disagree	11	3.8	9.0
	Agree	69	23.9	32.9
	Strongly Agree	194	67.1	100.0
I received information on COVID-19	Almost every day	242	83.7	83.7
	Two—three times per week	29	10.0	93.8
	More than three times per week	18	6.2	100.0

Table 3: Chi-Square Analysis of the Influence of Place of Residence on Exposure to Health Information of COVID-19

Level of Exposure	Place of Residence	Chi-Square	P-value
I was exposed to health information on COVID-19	Rural Urban	270.545	0.00*
I received information on COVID-19	Rural Urban	15.472	0.017*

*Significant at 0.05.

Sources of information for the PLWHA were presented in Table 4. Family/friends/neighbours (82.7%), healthcare workers (81.0%), and radio (78.5%) were the highest sources of information on COVID-19 among the respondents. Surprisingly, social media/internet (37.8%), television (27.3%), and newspapers (14.2%) were among the top sources of information for the PLWHA in the study area. Therefore, the influence of place of residence on their sources of information was ascertained using the chi-square measure of

association. The results were summarized in Table 5. The results show that only radio (chi-square = 28.332), newspapers (Chi-square = 14.343), social media/internet (Chi-square = 15.333), and healthcare workers (Chi-square = 30.627) with $p < 0.05$ were significantly influenced by the respondents' places of residence. These indicate that the respondents in the urban areas had more access to COVID-19 information through radios, newspapers, social media/internet, and healthcare workers than those in the rural areas. Information through family/friends/neighbours, television, and billboards was equally available to both rural and urban residents.

Table 4: Distribution of PLWHA's Sources of Information on COVID-19

Sources of information	Yes	No
Family/friends/neighbours	239(82.7%)	50(17.3%)
Radio	227(78.5%)	62(21.4%)
Television	79(27.3%)	210(72.7%)
Newspapers	41(14.2%)	248(85.8%)
Billboards	37(12.8%)	252(87.2%)
Social Media/Internet	108(37.4%)	181(62.6%)
Healthcare workers	234(81.0%)	55(19.0%)

Table 5: Influence of Place of Residence on Sources of Information on COVID-19

Sources of information	Chi-Square	P-value
Family/friends/neighbours	4.49	0.611
Radio	28.332	0.00*
Television	5.838	0.12
Newspapers	14.343	0.002*
Billboards	6.187	0.103
Social Media/Internet	15.333	0.002*
Healthcare workers	30.627	0.00*

*Significant at 0.05.

The most trusted sources of information for the PLWHA was summarized in Table 6 and show that the respondents (82.0%) relied most on COVID-19 information from healthcare workers. Very few (18.0%) of the PLWHA trusted COVID-19 information from the other sources such as radio, television, newspapers, social media and the internet.

Table 6: Most Trusted Sources of Information on COVID-19

Source of Information	Frequency	Percent	Cumulative Percent
Healthcare workers	237	82.0	82.0
Family/friends/neighbours	24	8.3	90.3
Government radio/television station	19	6.6	96.9
Private radio/television stations	1	.3	97.2
Newspapers	1	.3	97.6
Social Media/internet	7	2.4	100.0
Total	289	100.0	

Knowledge of COVID-19 among PLWHA

Table 7 presents the mean and standard deviation of knowledge items linked to COVID-19 among 289 respondents. Each item was rated on a four-point Likert Scale ranging from 1 = strongly disagree to 4 = strongly agree, with mean scores ranging from 2.63 to 3.53, showing generally moderate to high levels of agreement. Also, the standard deviations (SD) revealed moderate variability, indicating some diversity of responses. The respondents showed good knowledge across the domains examined, as all items were accepted. The highest mean scores were observed for "Difficulty in breathing" (3.53) and "Touching the eyes, nose, and mouth after touching an infected person or surface (3.53), thus suggesting strong awareness of vital symptoms and transmission modes. Other well-recognised items included "Cough" (3.42), "Regular washing of hands" (3.34), and "Wearing face mask" (3.32). However, relatively lower mean scores were observed for "Nausea" (2.62), "Loss of smell" (2.75), and "People living with HIV/AIDS are more likely to have severe symptoms" (2.73), indicating that some particular symptoms and vulnerabilities were less well known. Generally, the result shows a strong knowledge of COVID-19.

Table 7: Analysis of Knowledge about COVID-19 among PLWHA

Knowledge of COVID-19	N	Mean	SD	Decision
COVID-19 was caused by the novel SARS coronavirus 2	289	3.19	0.86	Accepted
Symptoms of COVID-19 include:				
Fever	289	3.31	1.07	Accepted
Fatigue	289	2.89	1.15	Accepted
Cough	289	3.42	0.90	Accepted
Difficulty in breathing	289	3.53	0.82	Accepted
Nausea	289	2.63	1.18	Accepted
Loss of smell	289	2.75	1.30	Accepted
Mode of transmission of COVID-19:				
Touching the eyes, nose, and mouth after touching an infected person or surface	289	3.53	0.80	Accepted
Air and droplets from the mouth of infected persons when they speak, laugh, sing, or sneeze	289	3.24	1.00	Accepted
Every person can be infected with COVID-19	289	3.02	0.88	Accepted
People with underlying diseases are more vulnerable to COVID-19	289	3.13	0.69	Accepted
People living with HIV/AIDS are more likely to have severe symptoms if they contract COVID-19	289	2.73	0.86	Accepted
Prevention of COVID-19:				
Wearing face mask when outdoors	289	3.32	0.88	Accepted
Regular washing of hands with soap under running water	289	3.41	0.93	Accepted
Use of hand sanitizer	289	3.22	0.93	Accepted
Observing physical distancing	289	3.31	0.88	Accepted
Taking COVID-19 vaccine	289	3.15	1.01	Accepted

Perception of COVID-19 AMONG PLWHA

The result presented in Table 8 offers detailed information on how the 289 respondents living with HIV/AIDS perceived the nature, severity, and personal relevance of the COVID-19 pandemic. Firstly, the respondents demonstrated a strong and clear appreciation of the severity of COVID-19. The highest mean scores in the table were recorded for the statements "COVID-19 is a serious disease" (Mean = 3.61, SD = 0.60) and "People with underlying diseases are likely to have severe symptoms" (Mean = 3.60, SD = 0.68). These scores, accompanied by relatively low standard deviations, are indicative of a strong consensus among participants. The risk perception was further reinforced by high agreement that "COVID-19 can kill" (Mean = 3.45, SD = 0.63) and that "Any person can be infected" (Mean = 3.18, SD = 0.82). Altogether, these results indicate that public messaging concerning the general dangers and universal susceptibility to the virus has been effectively communicated and internalized by this group.

Secondly, the results evidence a commendable rejection of widespread myths and misconceptions that circulated during the COVID-19 pandemic. The respondents strongly disagreed with the statement "COVID-19 killed only White people," which accounted for the least mean score of 1.91, SD = 0.80 and was subsequently rejected. Similarly, the misconception that COVID-19 was serious "only in Western countries" also received a low mean score (Mean = 2.40, SD = 1.01) and thus was rejected. Granted, the standard deviation for this latter item was slightly higher, suggesting somewhat more variability in opinion, the overall trend shows that the respondents were not susceptible to these racially and geographically charged falsehoods.

Thirdly, the data suggest a nuanced finding when examining perceptions of personal vulnerability. While respondents acknowledged the general risks faced by people with underlying conditions, their perception of risks specific to their own status as PLWHA was notably more subdued. The statements, "PLWHA are at great risk of contracting COVID-19 and are likely to have more severe symptoms if they contract COVID-19," received a mean score of 2.57 (SD = 0.92). Although this item was technically "accepted" as the mean fell above the midpoint of the scale, it is considerably lower than the scores for the general severity items. This suggests a potential disconnect: While PLWHA recognize that COVID-19 is a serious disease that disproportionately affects vulnerable groups, they may not fully internalize or acknowledge their own heightened vulnerability

as immunocompromised individuals. The moderate standard deviation of 0.92 also indicates some diversity of opinion on this matter within the group.

Table 8: Analysis of COVID-19 Perception by PLWHA

Perception of COVID-19	n	Mean	SD	Decision
COVID-19 is a serious disease	289	3.61	0.60	Accepted
COVID-19 was in Nigeria	289	2.95	0.87	Accepted
COVID-19 was serious only in Western countries	289	2.40	1.01	Rejected
COVID-19 can kill	289	3.45	0.63	Accepted
COVID-19 killed only White people	289	1.91	0.80	Rejected
Any person can be infected with COVID-19	289	3.13	0.82	Accepted
People with underlying diseases are likely to have severe symptoms when they contract COVID-19	289	3.60	0.68	Accepted
PLWHA are at great risk of contracting COVID-19 and are likely to have more severe symptoms if they contract COVID-19	289	2.57	0.92	Accepted

The influence of age, gender (male and female) and place of residence (urban and rural) of the respondents on their perceptions of COVID-19 were ascertained using the Chi-square measure of association. The summary of the results was presented in Table 9. There were significant influences ($p < 0.05$) of place of residence on the perceptions that COVID-19 was only serious in western countries (Chi-square = 23.21), COVID-19 killed only white people (Chi-square = 19.717) and that PLWHA were at greater risk of contracting the disease and suffering severe symptoms (Chi-square = 19.612). The notions of COVID-19 killing only white people or existed only in western countries were misinformation predominant in the rural areas. The urban residents had better information of PLWHA being at greater risk of the infection with severe symptoms.

Table 9: Influence of Age, Gender and Place of Residence on the Perception of COVID-19

Perception of COVID-19	Place of Residence	Gender	Age
COVID-19 is a serious disease	5.918	6.155	7.22
COVID-19 was in Nigeria	13.778	0.749	8.794
COVID-19 was serious only in western countries	23.21*	4.248	23.544*
COVID-19 can kill	7.166	9.384*	22.059*
COVID-19 killed only White people	19.717*	3.36	8.915
Any person can be infected with COVID-19	16.466	1.956	17.264
People with underlying diseases are likely to have severe symptoms when they contract COVID-19	7.994	2.212	23.212*
PLWHA are at great risk of contracting COVID-19 and are likely to have more severe symptoms if they contract COVID-19	19.612*	6.365	28.976*

*Chi-square value is significant at 0.05

Gender of the PLWHA only influenced their perception that COVID-19 can kill. Men in the study area were more defiant, skeptical, and believed that COVID-19 does not kill than the females, who were more cautious and convinced that COVID-19 was lethal. The respondents' age distribution significantly influenced ($p, 0.05$) their perceptions that COVID-19 was only serious in the western countries (Chi-square = 23.544), COVID-19 can kill (Chi-square = 22.059), people with underlying health conditions could suffer severe symptoms of COVID-19 (Chi-square = 23.212) and PLWHA were at greater risk of contracting the infection and suffering severe symptoms (Chi-square = 28.976). The younger people in the study areas had negative perceptions from misinformation that COVID-19 was only in the western world, killed only the whites while the blacks were immune against the infection. The older people who were more cautious about their health held the perception that people with underlying health conditions, including PLWHA were at great risk of contracting the infection with severe symptoms.

Adoption of COVID-19 Preventive Measures among PLWHA

The data in Table 10 reveal a significant gap between knowledge and practice regarding COVID-19 prevention among the 289 PLWHA surveyed. While respondents show strong theoretical awareness, acknowledging the efficacy of masks, hand washing, and vaccines (Mean = 3.55, SD = 0.65), knowledge does not consistently translate into personal behaviour. There was divergence in adoption of preventive measures. Regular hand washing was the most consistently practiced behaviour (Mean = 3.23, SD = 0.70), suggesting a strong ingrained habit. Physical distancing (Mean = 2.97) showed moderate adoption. However, hand sanitizer use was lower (Mean = 2.77), and COVID-19 vaccine uptake was the weakest positive action (Mean = 2.52). The high standard deviation for vaccination (1.20) highlights a deep divide, with significant hesitancy posing a critical risk for this potentially immune compromised group.

Data suggest that motivation for adherence to mask-wearing often stemmed from external compulsion (Mean = 2.52) rather than personal conviction, implying that compliance could falter without mandates. Respondents rejected minimal hand hygiene (Mean = 1.78), though they acknowledged challenges in consistently observing all protocols (Mean = 2.29).

In conclusion, PLWHA are knowledgeable about COVID-19 prevention but struggle with consistent application. Hand hygiene is strongly practiced, but low vaccine uptake and reliance on external enforcement for mask-wearing are key weaknesses. Findings highlight the need for targeted interventions that build intrinsic motivation and vaccine confidence, moving beyond information to foster sustained protective behaviours in this vulnerable population.

Table 10: Analysis of Respondents' Adoption of Preventive Measures

Adoption of Preventive Measures	n	Mean	SD	Decision
The use of face masks, regular hand washing, physical distancing, hand sanitizer, and COVID-19 vaccines can protect one against COVID-19	289	3.55	0.65	Accepted
To protect myself against COVID-19 I regularly wore face mask when outdoors.	289	2.91	0.93	Accepted
I regularly washed my hands with soap under running water.	289	3.23	0.70	Accepted
I observed physical distancing.	289	2.97	0.79	Accepted
I regularly used hand sanitizer.	289	2.77	0.90	Accepted
I took COVID-19 vaccine.	289	2.52	1.20	Accepted

I only wore face mask when I was compelled to do so such as at the bank or to avoid trouble with law enforcement officers.	289	2.52	0.97	Accepted
I only washed my hand when I wanted to eat.	289	1.78	0.78	Rejected
I did not always observe physical distancing.	289	2.29	0.94	Accepted

The influence of demographic factors such as place of residence, gender, age, level of education, marital status, occupation and monthly income of the PLWHA on their adoption of the COVID-19 preventive measures was ascertained with the Chi-square measure of association at 0.05 level of significance (see Table 11). At $p < 0.05$, the use of face mask, regular washing of hands, observing physical distancing, use of hand sanitizer and taking COVID-19 vaccine to protect against the infection was significantly dependent on the place of residence, occupation and monthly income of the PLWHA. Adoption of regular wearing of face mask was significantly ($p < 0.05$) dependent on the gender, age, level of education and occupation of the PLWHA. Adoption of regular washing of hands with soap under running water was significantly ($p < 0.05$) dependent on the gender, level of education and income level of the PLWHA. Also, observing physical distancing was significantly dependent on the age, level of education, marital status, occupation and income level of the respondents while use of hand sanitizer was significantly ($p < 0.05$) influenced by the respondents' level of income. Gender, age, level of education and income level significantly ($p < 0.05$) influenced the respondents' decision to take COVID-19 vaccine. The wearing of face mask under compulsion was also significantly dependent on the respondents' gender, age, level of education, occupation and income level.

Table 11: Influence of Demographic Factors on Adoption of COVID-19 Preventive Measures

Adoption of Preventive Measures	Place of residence	Gender	Age	Education	Marital status	Occupation	Income
The use of face masks, regular hand washing, physical distancing, hand sanitizer, and COVID-19 vaccines can protect one against COVID-19	18.359*	7.178	9.715	54.414	18.876	26.640*	29.402*
To protect myself against COVID-19 I regularly wore face mask when outdoors.	9.434	16.689*	19.663*	55.866*	9.579	23.789*	49.040
I regularly washed my hands with soap under running water.	12.476	8.445*	12.531	33.808*	7.826	17.769	29.689*
I observed physical distancing.	6.944	0.679	13.401*	41.191*	30.736*	31.570*	39.889*
I regularly used hand sanitizer.	10.657	2.349	7.150	61.475	10.656	13.273	56.343*
I took COVID-19 vaccine.	9.957	17.582*	25.746*	54.827*	12.915	42.913*	34.069*
I only wore face mask when I was compelled to do so such as at the bank or to avoid trouble with law enforcement officers.	13.518	9.640*	27.204*	30.304*	11.821	34.713*	38.055*
I only washed my hand when I wanted to eat.	17.169*	14.985*	11.711	34.834*	11.825	25.144*	31.934*
I did not always observe physical distancing.	10.501	11.569*	27.755*	56.834*	17.827	19.080	62.653

Discussion

This study examined exposure to information, knowledge, perception, and practices towards COVID-19 among people living with HIV/AIDS in Abia State, Southeast Nigeria. Results showed a high level of exposure to information on COVID-19 among PLWHA in Abia State. Urban residents were found to be more exposed to such information compared with rural dwellers. This should be expected considering the fact that the urban areas were largely the focus of official COVID-19 control measures. In addition, urban dwellers have better education and greater access to the mass media.

The results equally indicate significant reliance on interpersonal sources as well as the mass media for information on COVID-19. These sources include family/friends/neighbours and healthcare workers. Other studies have reported the effectiveness of family/friends (Erinoso et al., 2021; Wu et al., 2022) and healthcare workers (Chen et al., 2021; Iheanacho et al., 2021) as sources of information on the disease. Worthy of note too is the fact that the respondents reported trusting healthcare workers for information relative to other sources. This should be expected in view of the fact that PLWHA rely on their case managers to manage their health.

The study revealed a high level of knowledge about COVID-19 among PLWHA. This is evident in the high knowledge scores with respect to the cause, transmission routes, symptoms, and prevention of COVID-19. These findings are in consonance with previous studies (Iradukunda et al., 2021; Shallangwa et al., 2022). For example, among PLWHA in Rwanda, the level of knowledge about COVID-19 was high, with 97% of participants obtaining a high knowledge score. With people being swamped with daily information on the pandemic from the mainstream media, social media, and interpersonal sources, it should be expected that people would have a high level of knowledge about the pandemic.

In the same vein, the respondents were found to have a clear perception of the severity of the disease. They perceived COVID-19 as a serious disease that can kill and which any person can be infected with and understood that people with comorbidities are likely to have more severe symptoms when infected with COVID-19. However, they had a poor perception of their personal vulnerability. The current findings indicating that PLWHA in Abia State perceive COVID-19 as a serious threat yet view their personal risk as lower align with the observations by Ly et al. (2023) and Ssentongo et al. (2021) that PLWHA face higher risks from COVID-19 but often exhibit unique attitudes towards the disease and vaccination.

Data further revealed divergence in the application of safety protocols among PLWHA. While it would be expected that people with compromised immune system like PLWHA would naturally adhere to safety protocols that was not the case. While regular washing of hands under running water received a high mean score of 3.23, other measures had lower scores with vaccine uptake receiving a low mean score of 2.52. The foregoing indicates a disconnect between COVID-19 knowledge level and adoption of safety measures among PLWHA. This is consistent with other studies. For example, among PLWHA in Rwanda, the level of knowledge about COVID-19 was high, with 97% of participants obtaining a high knowledge score. However, a quarter of participants had poor attitudes

toward COVID-19, highlighting the need for targeted interventions to address attitudes and practices related to COVID-19 prevention in this population (Iradukunda et al., 2021).

Conclusion

This study examined the sources relied on by people living with HIV/AIDS in Abia State, Nigeria for information on COVID-19 and underscored how exposure to health information interacted with demographic variables to impact knowledge, perception, and practices towards COVID-19. The study found that despite high exposure to information and excellent knowledge about COVID-19 and perception of its severity, PLWHA in Abia state had a low perception of their own vulnerability and only moderate adherence to COVID-19 safety practices. In line with the findings of the study, future public health campaigns should incorporate sources trusted by PLWHA such as healthcare workers for maximum impact.

Acknowledgments:

The author wishes to appreciate Zebbedee Ugwu and all case managers at the health facilities for their invaluable assistance in data gathering.

Conflict of Interest:

There was no conflict of interest with any sources or persons from the beginning to the end of the study.

Ethical Clearance

The author obtained ethical clearance (CertificateNO:**REC/DMC/UNN/10005-20250315**) from the Research Ethics Committee of the Department of Mass Communication, University of Nigeria, Nsukka.

External Funding Sources

The author did not receive funding from any organization, person(s) or group for this study.

References

- Adams, S., Urman, A., Arlt, D., Gil-Lopez, T., Makhortykh, M., & Maier, M. (2023). Media Trust and the COVID-19 Pandemic: An Analysis of Short-Term Trust Changes, Their Ideological Drivers and Consequences in

- Switzerland. *Communication research*, 50(2), 205–229.
<https://doi.org/10.1177/00936502221127484>
- Aloui-Zarrouk, Z., El Youssfi, L., Badu, K., Fagbamigbe, A. F., Matoke-Muhia, D., Ngugi, C., Dukhi, N., & Mwaura, G. (2020). The wearing of face masks in African countries under the COVID-19 crisis: Luxury or necessity? *Open Research Africa*. <https://openresearchafrica.org/articles/3-36>.
- Asheq, A., Ashames, A., Al-Tabakha, M., Hassan, N. & Jairoun, A. (2021). Medication adherence in Type 2 diabetes mellitus patients during COVID-19 pandemic: a cross sectional study from the United Arab Emirates. *F1000 Research*, 10, 435 DOI:10.12688/f1000research.51729.2
- Azlan, A.A., Hamzah, M.R., Sern, T.J., Ayub, S.H. & Mohamad, E. (2020). Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia. *PLoS ONE*, 15(5), e0233668. DOI:10.1371/journal.pone.0233668
- Barua, Z., Barua, S., Aktar, S., Kabir, N. & Li, M. (2020). Effects of misinformation on COVID-19 individual responses and recommendations for resilience of disastrous consequences of misinformation. *Progress in Disaster Science*, 8, 100119. DOI: <https://doi.org/10.1016/j.pdisas.2020.100119>
- Bashir, S., Moneeba, S., Alghamdi, A., Alghamdi, F., Niaz, A., Anan, H. & Kaleem, I. (2021). Comorbidities in patients with COVID-19 and their impact on the severity of the disease. *Journal of Health and Allied Sciences*, 11 (1), 1-7. DOI: 10.1055/s-0040-1718848
- Callaghan, T., Lueck, J. A., Trujillo, K. L., & Ferdinand, A. O. (2021). Rural and Urban Differences in COVID-19 Prevention Behaviors. *The Journal of rural health: official journal of the American Rural Health Association and the National Rural Health Care Association*, 37(2), 287–295. <https://doi.org/10.1111/jrh.12556>
- Chen, Y., Tan, X., Xing, C., & Zheng, J. (2021). How healthcare workers respond to COVID-19: The role of vulnerability and social support in a close relationships defense mechanism. *Acta Psychologica*, 221, 103442.
- Clark, C., Davila, A., Regis, M., & Kraus, S. (2020). Predictors of COVID-19 voluntary compliance behaviors: an international investigation. *Global Transitions*, 2, 76-82. DOI: 10.1016/j.jlt.2020.6.003.
- Chibuike, D. (January 15, 2025). 46,788 undergoing HIV/AIDS treatment in Abia – ABSACA. *Daily Post*. <https://dailypost.ng/2025/01/15/46788-undergoing-hiv-aids-treatment-in-abia-absaca/>
- Comrey, A. L., & Lee, H. B. (1992). *A First Course in Factor Analysis*. Hillsdale, NJ: Lawrence Erlbaum Associates.
<https://www.scirp.org/reference/referencespapers?referenceid=2345916>
- Daniel, O., Bamidele, J., Gbadebo, A., Ojo, A. & Adeyemi, O. (2021). Knowledge, Perception, and Preventive Practices of COVID-19 among primary

- healthcare workers in Ogun State, Nigeria. *BUMJ*, 4(2), 140-150 DOI: <https://doi.org/10.38029/bumj.v4i2.92>
- Di Novi, C., Leporatti, L., Levaggi, R., & Montefiori, M. (2022). Adherence during COVID-19: The role of aging and socio-economics status in shaping drug utilization. *Journal of economic behavior & organization*, 204, 1–14. <https://doi.org/10.1016/j.jebo.2022.10.012>
- Ditekemena, J.D., Nkamba, D.M., Muhindo, H.M., Siewe, J.N.F., Luhata, C., Bergh, R.V., Kitoto, A.T., Damme, W.V., Muyembe, J.J. & Colebunders, R. (2021). Factors associated with adherence to COVID-19 prevention measures in the Democratic Republic of the Congo (DRC): results of an online survey. *BMJ Open*, 11, e043356. DOI: 10.1136/bmjopen-2020-043356.
- Edogor, O. I., Jonah, A.A., & Ojo, L.I. (2015). Nigerian Users' Evaluation of Credibility of Social Media Sites. *New Media and Mass Communication*, 40, pp.139-150. <https://www.iiste.org/Journals/index.php/NMMC/article/view/24941>
- Ejaz, H., Alsrhani, A., Zafar, A., Javed, H., Junaid, K., Abdalla, A.E., Abosalif, K.O.A., Ahmed, Z. & Younas, S. (2020). COVID-19 and comorbidities: Deleterious impact on infected patients. *Journal of Infection and Public Health*, 13, 1833-1839. DOI: <https://doi.org/10.1016/j.jiph.2020.07.014>
- Erinoso, O., Wright, K. O., Anya, S., Kuyinu, Y., Abdur-Razzaq, H., & Adewuya, A. (2021). Predictors of COVID-19 Information Sources and Their Perceived Accuracy in Nigeria: Online Cross-sectional Study. *JMIR public health and surveillance*, 7(1), e22273. <https://doi.org/10.2196/22273>
- Folayan, M.O., Ibigbami, O., Brown, B., Tantawi, M., Uzochukwu, B., Ezechi, O.C., Aly, N.M., Abeldano, G.F., Ara, E., Ayanore, M.A., Ayoola, O.O., Osamika, B.E., Ellakany, P., Gaffar, B., Idigbe, I., Ishabiyi, A.O., Jafar, M., Khan, A.T-A., Khalid, Z., Lawal, F.B., Lusher, J., Nzimande, N., Popoola, B.O., Quadri, M.F.A., Rashwan, M., Roque, M., Shamala, A., Al-Tammemi, A.B., Yousaf, M.A., Zuniga, R.A.A., Okeibunor, J.C. & Nguyen, A.L. (2022). Differences in COVID-19 preventive behaviour and food security by HIV status in Nigeria. *AIDS and Behaviour*. DOI: 10.1007/s10461-021-03433-3
- Fridman, I., Lucas, N., Henke, D. & Zigler, C.K. (2020). Association between public about COVID-19 trust in information sources and adherence to social distancing: cross-sectional survey. *JMIR Public Health and Surveillance*, 6 (3), e22060.
- Harper, C.A., Satchell, L.P., Fido, D. & Latzman, R.D. (2020). Functional fear predicts health compliance in the COVID-19 pandemic. *International Journal of Mental Health and Addiction*, 19, 1875-1888. DOI: <https://doi.org/10.1007/s11469-020-00281-5>.

- Huang, X., Yu, M., Fu, G., Lan, G., Li, L., Yang, J., Qiao, Y., Zhao, J., Qian, H. Z., Zhang, X., Liu, X., Jin, X., Chen, G., Jiang, H., Tang, W., Wang, Z., & Xu, J. (2021). Willingness to Receive COVID-19 Vaccination Among People Living With HIV and AIDS in China: Nationwide Cross-sectional Online Survey. *JMIR public health and surveillance*, 7(10), e31125. <https://doi.org/10.2196/31125>
- Iheanacho, T., Stefanovics, E., Okoro, U. G., Anyaehie, U. E., Njoku, P. O., Adimekwe, A. I., Ibediro, K., Stefanovics, G. A., Haeny, A., Jackson, A., Unamba, N. N., Isiguzo, G., Chukwu, C. C., Anyaehie, U. B., Mbam, T. T., Osy-Eneze, C., & Ibezim, E. O. (2021). Assessing knowledge, attitude, practice and training related to COVID-19: A cross-sectional survey of frontline healthcare workers in Nigeria. *BMJ Open*, 11(e050138). <https://doi.org/10.1136/bmjopen-2021-050138>.
- Ipinnimo, T.M., Sanni, T. A., Aladesuru, T.A., Adebayo, O.A., Omowaye, M.T., Adeniyi, I.O., Ipinnimo, O.M., Olasehinde, O.K. & Adetunbi, A.R. (2021). Knowledge of COVID-19 and practice of preventive measures among adult residents during the ease of lockdown in Nigeria. *Nig J Med* 30, 464-469.
- Iradukunda, P. G., Pierre, G., Muhozi, V., Denhere, K., & Dzinamarira, T. (2021). Knowledge, Attitude, and Practice Towards COVID-19 Among People Living with HIV/AIDS in Kigali, Rwanda. *Journal of community health*, 46(2), 245–250. <https://doi.org/10.1007/s10900-020-00938-1>.
- Kalichman, S. C., Shkembi, B., Kalichman, M. O., & Eaton, L. A. (2021). Trust in health information sources and its associations with COVID-19 disruptions to social relationships and health services among people living with HIV. *BMC Public Health*, 21, 817. <https://doi.org/10.1186/s12889-021-10856-z>.
- Kaso, A.W., Hareru, H.E., Agero, G. & Ashuro, Z. (2021). Assessment of practice of COVID-19 preventive measures and associated factors among residents in Southern Ethiopia. *PLoS ONE*, 16(2), e0261186. DOI: <https://doi.org/10.1371/journal.pone.0261186>
- Kigatiira, K.K. (2020). Fear of contracting COVID-19: Influence of information sources and message content on fear-arousal among Boda-Boda riders in Nairobi County, Kenya. *International Journal of Research-Granthaalayah*, 8(8), 190-199. DOI: 10.29121/granthaalayah.v8.i8:2020.998.
- Kim, E. J., & Bayun, M. (2024). Factors Affecting Adherence to Social Distancing among Adults Aged 19-44 Years: Insights from a Nationwide Survey during COVID-19 Pandemic. *Medicina (Kaunas, Lithuania)*, 60(5), 827. <https://doi.org/10.3390/medicina60050827>.
- Kirschke, R. (2024). Newspaper publishing in times of COVID-19. <https://eco3.com/news/newspaper-publishing-in-times-of-covid-19>

- Lawal, M.O., Kareem, A.O., & Adebayo, D.O. (2022). Artisans' Disposition and Adherence to Preventive Measures of Coronavirus Disease in Osun State, Nigeria. In E. Osabuohien, G. Odularu, D. Ufua, & R. Osabohien (Eds.), *COVID-19 in the African Continent* (pp. 95-107). Emerald Publishing Limited. <https://doi.org/10.1108/978-1-80117-686-620221009>
- Lee, T., Johnson, T., Jia, C., & Lacasa-Mas, I. (2023). How social media users become misinformed: The roles of news-finds-me perception and misinformation exposure in COVID-19 misperception. *New Media & Society*. <https://doi.org/10.1177/14614448231202480>
- Li, Z-H., Zhang, X-R., Zhong, W-F., Song, W-Q., Wang, Z-H., Chen, Q., Liu, D., Huang, Q-M., Shen, D., Chen, P-L., Mao, A., Zhang, D., Yang, X., Wu, X-B. & Mao, C. (2020). Knowledge, attitudes, and practices related to coronavirus disease 2019 during the outbreak among workers in China: A large cross-sectional study. *PLoS Negl Trop Dis*, 14(9), e0008584. DOI: 10.1371/journal.pntd.0008584.
- Ly, X., Zhao, C., Song, B., Huang, H., Song, S., Long, H., Liu, W., Du, M., Liu, M., & Liu, J. (2023). COVID-19 vaccination in people living with HIV and AIDS (PLWHA) in China: A cross-sectional study. *Human vaccines & immunotherapeutics*, 19(1), 2151798. <https://doi.org/10.1080/21645515.2022.2151798>.
- Mahmood, S., Hussain, T., Mahmood, F., Ahmad, M., Majeed, A., Beg, B.M. & Areej, S. (2020). Attitude, perception, and knowledge of COVID-19 among general public in Pakistan. *Frontiers in Public Health*, 8, 602434. DOI:10.3389/fpubh.2020.602434
- Matias, L.D.M., Luciena, J.G.S., Azevedo, T.F., Silva, A.L.D.A., Costa, M.M.L. & Andrade, L.L. (2021). Factors related to the prevention of COVID-19 in people with diabetes: a cross-sectional study. *Online Brazilian Journal of Nursing*, 20 (Suppl. 1), e20216517. DOI: 10.17665/1676-4285.20216517
- Matusiak, Ł., Szepietowska, M., Krajewski, P., Białynicki-Birula, R., & Szepietowski, J. C. (2020). Inconveniences due to the use of face masks during the COVID-19 pandemic: A survey study of 876 young people. *Dermatologic therapy*, 33(4), e13567. <https://doi.org/10.1111/dth.13567>.
- Mekonnen, C.K., Ferede, Y.M. & Abate, H.K. (2021). Determinants of dietary adherence among Type 2 diabetes patients aimed COVID-19 at the University of Gondar Comprehensive Specialized Hospital. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy*, 14, 917-927
- Mohamadpour, F., Askarian, A., & Askarian, M. (2024). Picture analysis of billboards and infographic graphics advertising COVID-19 on promoting preventive behaviors and taking vaccination against the Coronavirus

- disease pandemic. *Scientific reports*, 14(1), 6310.
<https://doi.org/10.1038/s41598-024-56758-z>
- Narayana, G., Pradeepkumar, B., Ramaiah, J. D., Jayasree, T., Yadav, D. L., & Kumar, B. K. (2020). Knowledge, perception, and practices towards COVID-19 pandemic among general public of India: A cross-sectional online survey. *Current medicine research and practice*, 10(4), 153–159.
<https://doi.org/10.1016/j.cmrp.2020.07.013>
- Njingu, A. E., Jabbossung, F. E., Ndip-Agbor, T. E., & Dedino, A. G. (2021). Comparing knowledge, attitudes and practices regarding COVID-19 amongst Cameroonians living in urban versus rural areas. *The Pan African medical journal*, 38, 234.
<https://doi.org/10.11604/pamj.2021.38.234.25964>
- Ogunsola, F. T., Ejekam, C. S., Balogun, M., Ugonna, I., Odukoya, O., Oduyebo, O., Adeyemo, W. L., Oladele, R. O., & Akanmu, S. A. (2023). Universal use of face mask for the prevention of the spread of COVID-19 in community settings in a South-western State of Nigeria: willingness and barriers. *Antimicrobial resistance and infection control*, 12(1), 64.
<https://doi.org/10.1186/s13756-023-01267-3>
- Olapegba, P.O., Ayandele, O., Kolawole, S.O., Oguntayo, R., Gandhi, J.C., Dangiwa, A.L., Ottu, I.F.A. & Iorfa, S.K. (2020). COVID-19 knowledge and perception in Nigeria. Retrieved August, 9, 2022 from
- Oliveira, S.K.P., Belchior, A.B., Carvalho, R.E.F., Fernandes, R, F., Albuquerque, N.V. & Vasconcelos, P.F. (2021). Prevention measures against COVID-19 performed by people with diabetes mellitus. *Journal of Nursing Education and Practice*, 11(3), 47-52 DOI: <https://doi.org/10.5430/jnep.v11n3p47>
- Papagiannis, D., Malli, F., Raptis, D.G., Papathanasiou, I.V., Fradelos, E.C., Daniel, Z., Rachiotis, G.& Gourgoulisanis, K. (2020). Assessment of knowledge, attitudes, and practices towards new corononavirus (SARS COV-2) of health care professionals in Greece before the outbreak period. *International Journal of Environmental Research and Public Health*, 17, 4925. DOI: 10.3390/ijerph17144925
- Peng, Y., Pei.C., Zhang,Y., Wang, J., Zhang, K., Zhang, Z. & Zhu, P. (2020). A cross-sectional survey of knowledge, attitude and practice associated with COVID-19 among undergraduate students in China. *BMC Public Health*, 20, 1292. DOI: 10.1186/s12889-020-09392
- Sanyaolu, A., Okorie, C., Marinkovic, A., Patidar, R., Younis, K., Desai, P., Hosein, Z., Padda, I., Mangat, J. & Altaf, M. (2020). Comorbidity and its impact on patients with COVID-19. *SN Comprehensive Clinical Medicine*. DOI: <https://doi.org/10.1007/s42399-020-00363-4>

- Schmalzle, R., Renner, B. & Scupp, H.T. (2017). Health risk perception and risk communication. *Policy Insights from the Behavioral and Brain Sciences*, 4 (2). 163-169
- Serwaa, D., Lamptey, E., Appiah, A-B., Senkyre, E.K. & Ameyaw, J.K. (2020). Knowledge, risk perception and preparedness towards coronavirus disease-2019 (COVID-19) outbreak among Ghanaians: a quick online cross-sectional survey. *Pan African Medical Journal*, 35(2), 44. DOI: 10.11604/pamj.2020.35.2.22630
- Shallangwa, M. M., Iwenya, H., Musa, S. S., Manirambona, E., Hameed, M. A., & Lucero-Prisno III, D. E. (2022). Knowledge, attitude and practice towards COVID-19 among people living with HIV/AIDS attending State Specialist Hospital Maiduguri, Borno State, Nigeria. *PAMJ - One Health*, 8, 10. <https://doi.org/10.11604/pamj-oh.2022.8.10.34815>
- Shimels, T., Kassu, R.A., Bogale, G., Bekele, M., Getnet, M., Getachew, A. Shewamene, Z. & Abraha, M. (2021). Magnitude and associated factors of poor medication adherence among diabetic and hypertensive patients visiting public health facilities in Ethiopia during the COVID-19 pandemic. *PLoS ONE*, 16(4), e0249222. DOI: 10.1371/journal.pone.0249222
- Ssentongo, P., Heilbrunn, E. S., Ssentongo, A. E., Advani, S., Chinchilli, V. M., Nunez, J. J., & Du, P. (2021). Epidemiology and outcomes of COVID-19 in HIV-infected individuals: a systematic review and meta-analysis. *Scientific reports*, 11(1), 6283. <https://doi.org/10.1038/s41598-021-85359-3>.
- Stolzenberg, L., Huang, A., Usman, M., & MacGregor, G. (2023). A Descriptive Survey Investigating the Impact of the COVID-19 Pandemic on the Public's Perception of Healthcare Professionals. *Cureus*, 15(7), e41703. <https://doi.org/10.7759/cureus.41703>
- Sun, Y., Cheng, K. J., & Monnat, S. (2022). Rural-Urban and Within-Rural Differences in COVID-19 Mortality Rates. *Journal of Rural Social Sciences*, 37(2), Article 3. Retrieved from <https://egrove.olemiss.edu/jrss/vol37/iss2/3>
- Taye, M.G., Bose, L., Beressa, T.B., Tefera, G.M., Mosisa, B., Dinsa, H., Birhanu, A. & Umeta, G. (2020). COVID-19 knowledge, attitudes, and preventive practices among people with hypertension and diabetes mellitus attending public health facilities in Ambo, Ethiopia. *Infection and Drug Resistance*, 13, 420-4214
- Vanherle, R., Kurten, S. & Rousseau, A. (2023). How social media, news media and interpersonal communication relate to COVID-19 risk perception and behaviours. *European Journal of Health Communication*, 4(1), 28-50 DOI: 10.47368/ejhc.2023.102

- Villela, F.M., Lopez, R.V.M., Sato, A.P.S., Oliveira, F.M., Waldman, E.A., Bergh, R.V., Fodgo, J.N.S. & Colebunders, R. (2021). COVID-19 outbreak in Brazil: adherence to national preventive measures and impact on people's lives, an online survey. *BMC Public Health*, 21, 152 DOI: 10.1186/s12889-021-10222-z
- Waterfield, K.C., Shah, G.H., Etheredge, G.D. & Ikhile, O. (2021). Consequences of COVID-19 crisis for persons with HIV: the impact of social determinants of health. *BMC Public Health*, 21, 299 DOI: <https://doi.org/10.1186/s12889-021-10296-9>
- Wolf, M.S., Serper, M., Opsasnick, L., O'Connor, R.M., Curtis, L., Beavente, J.Y., Wismer, G., Batio, S., Eifler, M., Zheng, P., Russell, A., Arvanitis, M., Ladner, D., Kwasny, M., Persell, S.D., Rowe, T., Linder, J.A. & Bailey, S.C. (2020). Awareness, attitudes, and actions related to COVID-19 among adults with chronic conditions at the onset of the U.S. outbreak: a cross-sectional survey. *Ann Intern Med*, 173, 100-109. DOI: 10.7326/M20-1239.
- Wu, G., Deng, X., & Liu, B. (2022). Managing urban citizens' panic levels and preventive behaviours during COVID-19 with pandemic information released by social media. *Cities (London, England)*, 120, 103490. <https://doi.org/10.1016/j.cities.2021.103490>.
- Zhang, X., Du, L., Huang, Y., Luo, X., & Wang, F. (2024). COVID-19 information seeking and individuals' protective behaviors: examining the role of information sources and information content. *BMC Public Health*, 24(1), 316. <https://doi.org/10.1186/s12889-024-17770-0>.