

Covid-19 Vaccine Acceptance Among Patients Living with Cancers in Selected Teaching Hospitals in South West, Nigeria

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Abstract:

This research examines COVID-19 vaccine acceptance among people living with cancers in three selected Teaching Hospitals in South-West, Nigeria. The research adopted a cross-sectional study design and a self-designed questionnaire was utilized to collect the data from 375 cancer patients who were selected from the teaching hospital using proportional stratified random sampling techniques. Data were analyzed using descriptive statistics, chi-square, correlation, and ANOVA on SPSS version 27 with p-value of 0.005. The result showed that 115 (30.7%) were male and 260 (69.3%) were female respondents. The most prevalent cancer diagnosis among respondents was breast cancer, representing (40.0%) of cases. The majority of patients (90.1%) were diagnosed with cancer within the last 24 months, indicating recent diagnoses. The mean knowledge score was 32.3 ± 4.1 where the majority (55.5%) had good knowledge and few (44.5%) had low knowledge about the Covid-19 vaccine. The mean acceptability score was 49.5 ± 7.0 with 50% of participants demonstrating a high level of acceptability and the remaining 50% exhibiting a lower level of acceptability towards COVID-19 vaccine. The research showed that there is a statistically significant association between knowledge and the level of acceptability of the COVID-19 vaccine among cancer patients ($X^2 = 27.592$; $p = 0.000$). It was recommended among others that there should be full implementation of the policies on the prioritization of the COVID-19 vaccine among cancer

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patients. Health care workers should be adequately trained on effective communication with cancer patients about COVID-19 vaccine.

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Introduction

Cancer and COVID-19 have significantly affected world health, with cancer responsible for approximately 10 million fatalities in 2020 (Ferrari et al., 2021) and COVID-19 being labelled a pandemic by the WHO in early 2020 (Osakinle et al., 2021). As of November 2021, COVID-19 has resulted in over 5 million fatalities and infected in excess of 259 million individuals globally (Yang et al., 2021). Vaccines were rapidly produced to address the virus, including two authorised by the WHO from China (Mallapaty 2021). Cancer patients are a susceptible demographic, with heightened sensitivity to catastrophic consequences from COVID-19 (liu et al., 2020). Concerns regarding vaccine safety for immunocompromised individuals have led to considerable reluctance towards COVID-19 vaccination among cancer patients, despite recommendations from organisations such as ESMO and the National Comprehensive Cancer Network, which emphasise the importance of prioritising vaccination for this demographic (Garassino et al., 2021).

Vaccine reluctance continues to be a significant obstacle in pandemic management, particularly among cancer patients, despite evidence demonstrating the advantages of vaccination for this demographic (Monin et al., 2021; Lazarus et al., 2021). Research from many nations indicates variable vaccination acceptance rates among cancer patients, with significant refusal rates seen in France, Italy, and Poland, where reluctance was associated with doubts over vaccine safety and effectiveness (Di-Noia et al., 2021). Cancer patients have shown greater vaccine acceptance rates compared to the general population, as seen by a Chinese study indicating that only 8.7% of non-cancer persons declined immunisation Wang et al., (2020). Factors influencing vaccine acceptance include demographic variables and faith in vaccine safety (Del-Riccio et al., 2021). Vaccine reluctance exhibits significant regional variation, indicative of a complex interaction of confidence, information, and cultural attitudes towards vaccination (WHO, 2020).

Studies indicate that cancer patients often have diminished immune responses to COVID-19 vaccines, especially in those with haematological malignancies and those receiving certain cancer therapies that compromise immune function. B cell-depleting medications and current chemotherapy, particularly when given between 28 days and six months after vaccination, have shown significant correlations with reduced antibody production and neutralising efficacy (Monin et al., 2021). Research indicates that cancer patients typically experience comparable mild side effects from mRNA COVID-19 vaccines as the general population; however, the longevity of their immune response tends to diminish, rendering booster doses particularly crucial for maintaining protection (Ligumsky et al., 2022). Consequently, several healthcare organisations advise that cancer patients regularly get three doses to attain immunity levels similar to those of non-cancer patients.

Due to the diminishing immune response, booster dosages are especially advantageous for cancer patients, many of whom are at an elevated risk of catastrophic COVID-19 outcomes because of their impaired immunity. Research indicates that booster doses are safe and usually well-accepted by patients, with those with a history of SARS-CoV-2 infection frequently exhibiting more robust immune responses to vaccination, highlighting the need of boosters. Additionally, some populations, such those receiving chemotherapy or stem cell transplantation, may need periodic booster doses or innovative vaccinations in the future to



provide sufficient protection. Vaccination, although some immunological constraints, is essential for cancer patients, who have an elevated risk of severe COVID-19 consequences and death (Rieger et al., 2018).

The immunisation uptake among cancer patients exhibits considerable regional variation. Global vaccination willingness decreased from 86% in March 2020 to 54% by July of that year, with a research in the Middle East indicating notably low rates, including 23.6% in Kuwait and 28.4% in Jordan (WHO, 2021). Contrasting results were seen in other locations, with 72.2% of Romanian cancer patients indicating a willingness to vaccinate and 71% of American cancer patients questioned expressing readiness to receive the vaccination (Gheorghe et al., 2021). Population surveys indicated significant acceptability in Ecuador and Malaysia, but Italy, Russia, and France had lower acceptance rates.

The "5C" model—Confidence, Constraints, Calculation, Collective Responsibility, and Complacency—offers insights into the determinants of vaccine uptake. Trust in public health institutions and authorities greatly impacts vaccine confidence and readiness to vaccinate (Roozenbeek et al., 2020). Reluctance often coincides with distrust in health authorities, as shown by the HPV vaccination. Moreover, political ideologies influence willingness, since vaccination hesitancy is more prevalent among those associated with non-governing political factions or conspiracy theorists. Mitigating vaccination hesitancy requires cultivating confidence in scientific and public health institutions while combating disinformation.

Constraints and shared accountability can influence vaccine choices. Pandemic weariness may hinder vaccination efforts, but prosocial incentives and a sense of community duty are positively associated with vaccination rates, as people often choose to vaccinate to save others. As a result, this study will be conducted among cancer patients in South Western, Nigeria to assess vaccination acceptance rates. There is hardly any information available, and literature on this topic for cancer patients in Nigeria, especially covering the western part of the country, has been published until now.

The specific objectives are to;

- 1.0 determine the level of knowledge that cancer patients have about COVID-19; and
- 2.0 determine the level of acceptance of the COVID-19 vaccine among patients living with cancers.

The research was directed by the below hypothesis:

H₀1: There is no significant association between knowledge and acceptance rate of COVID19 vaccine among cancer patients.

Materials and Methods

The research employed a descriptive cross-sectional survey design, ideal for capturing data from cancer patients in South-West Nigerian teaching hospitals at a single point in time. Data was gathered using a structured questionnaire, which was distributed to selected patients who met the inclusion criteria, such as being 18 years or older and undergoing palliative cancer care in these hospitals. The study specifically targeted the Lagos State University Teaching Hospital (LASUTH), Ladoke Akintola University Teaching Hospital (LAUTECH), and Ekiti State University Teaching Hospital (EKSUTH). These hospitals, equipped with



specialized oncology units, provided access to cancer patients who offered insights into their knowledge and acceptance of the COVID-19 vaccine.

The target population included cancer patients from each hospital's cancer unit, with an estimated total of 650 patients. The sampling was proportionate and stratified, ensuring representation from each hospital: 350 patients from LASUTH, 200 from LAUTECH, and 100 from EKSUTH. Using Cochran's sample size formula, the study aimed for a final sample size of 375, adjusted to account for non-responses. A simple random sampling method was used to select participants, ensuring a representative and unbiased sample from each facility's cancer patient population.

Data collection was conducted via a self-administered questionnaire, written in English, which covered a range of topics related to socio-demographic characteristics, cancer history, and the respondents' knowledge and acceptance of the COVID-19 vaccine. The questionnaire consisted of four sections, with response options including 'Yes,' 'No,' and 'Not Sure.' To ensure content validity, oncology experts reviewed the questionnaire, while face validation included alignment with the study's objectives and hypotheses. Test-retest reliability was applied, yielding a Cronbach's Alpha coefficient of 0.70, which confirmed the questionnaire's internal consistency. Prior to data collection, ethical approvals were obtained from the state health ministries and teaching hospitals' ethical committees, ensuring adherence to research ethics and the participants' confidentiality. Consent forms were also provided, and detailed information about the study's purpose and benefits was shared with each participant. For participants unable to read or write, researchers assisted in completing the questionnaire by reading each question aloud and marking responses according to the participants' selections. The data analysis plan was structured to address the research objectives and hypotheses. Descriptive statistics such as frequency tables and measures of central tendency were used to analyze socio-demographic variables and levels of knowledge and acceptance of the COVID-19 vaccine among cancer patients. For inferential statistics, chi-square tests and regression analysis were applied to test hypotheses regarding the relationship between knowledge and acceptance of the COVID-19 vaccine and the influence of socio-demographic characteristics on vaccine acceptance, using a significance level of 0.05. Ethical considerations were thoroughly addressed, with approvals from relevant health authorities and informed consent from all participants. The study prioritized confidentiality, ensuring all data collected was securely stored and used solely for research purposes. The ethical review process provided additional oversight to confirm that the study's methodology and data collection processes adhered to acceptable ethical standards in medical research.

Results

In this study, three hundred and seventy-five respondents with a mean age of 43.4 ± 12.0 years participated, of whom (18.9%) were between the ages of 31 and 39. The majority of respondents (69.3%) were female, over half (65.1%) were Yoruba, many (63.7%) identified as Christians, and over half (46.9%) held a tertiary degree as their highest level of education. The majority (65.6%) of those who were married had monogamous marriages, and many (45.9%) were married. Furthermore, a sizable portion of the respondents—45.9%—were self-employed.



Table 1: Socio-Demographic Characteristics of Respondents (n = 375)

Variable	Frequency	Percentage
Sex		
Male	115	30.7
Female	260	69.3
Ethnicity		
Yoruba	244	65.1
Igbo	111	29.6
Hausa/ Fulani	11	2.9
Others	9	2.4
Age		
Below 31	57	15.2
31-39	71	18.9
40-49	135	36.0
50-59	71	18.9
60-69	34	9.1
Above 69	7	1.9
Highest Level of Education		
No formal education	7	1.9
Primary education	15	4.0
Secondary education	164	43.7
Tertiary education	176	46.9
Marital Status		
Single	87	23.2
Married	199	53.1
Divorced	31	8.3



Widowed	31	8.3
Separated	27	7.2
Type of Marriage		
Monogamous	246	65.6
Polygamous	129	34.4
Religion		
Christianity	239	63.7
Islam	127	33.9
Traditional	9	2.4
Media Exposure		
Exposed	146	38.9
Not Exposed	229	61.1

Source: Field Survey, 2024

Cancer Information

The average time of cancer diagnosis was 1.2 ± 0.7 months. The majority of patients (90.1%) were diagnosed with cancer within the last 24 months, indicating recent diagnoses. A small percentage of patients (1.6%) had been living with cancer for 59-68 months, suggesting longer-term cases. Regarding family history, a significant portion of patients (76.3%) reported no family history of cancer, while the remaining (23.7%) did report a family history. This suggests that while familial predisposition to cancer exists for some patients, the majority did not have such a history.

The most prevalent cancer among respondents was breast cancer, representing (40.0%) of cases. Following this, (18.1%) of respondents were diagnosed with Head and neck cancer, while (13.9%) had Gynecologic cancer. Other notable diagnoses included Digestive tract cancer (8.5%), Urogenital cancer (8.3%), and Respiratory and thoracic cancer (8.0%). A smaller fraction of respondents reported other types of cancer (2.9%), with only a minimal percentage indicating multiple types of cancer (0.3%). A notable proportion of the respondents (60.5%) reported no instances of metastasis in their cancer, indicating localized disease. Conversely, 39.5% of respondents reported experiencing metastasis, signifying the spread of cancer to other areas within their bodies. This distribution highlights the prevalence of cancer metastasis among the sample population. The respondents of this study were found to be undergoing different forms of treatment procedures. The majority (43.2%) had chemotherapy, followed by radiotherapy (18.7%) and surgery procedures (21.1%),



Traditional therapy (2.7%), Multiple therapies (1.3%), and immunological and molecular-targeted therapy (0.3%) were administered to a lesser proportion of respondents. Furthermore, 11.2% of participants stated they had not received any kind of treatment.

Table 2: Cancer Information

Variable	Frequency	Percentage
Time since cancer diagnosis		
Below 25	338	90.1
25-48	23	6.1
49-58	1	0.3
59-68	6	1.6
Above 68	7	1.9
Family history of cancer		
Yes	286	76.3
No	89	23.7
Type of cancer		
Breast cancer	150	40.0
Head and neck cancer	68	18.1
Respiratory and thoracic cancer	30	8.0
Digestive tract cancer	32	8.5
Urogenital cancer	31	8.3
Gynecologic cancer	52	13.9
Multiple types of cancer	1	0.3
Other types of cancer	11	2.9
Metastasis of cancer		
No	227	60.5
Yes	148	39.5
Ongoing treatment for cancer		
None	42	11.2
Surgery	79	21.1
Radiotherapy	70	18.7
Chemotherapy	162	43.2
Immunological and molecular-targeted therapy	2	0.5
Traditional medicine	10	2.7
Multiple therapies	5	1.3
Other therapy	5	1.3

Source: Field Survey, 2024

Knowledge of the COVID-19 vaccine among Cancer patients

The mean knowledge score was 32.3 ± 4.1 where the majority (55.5%) had good knowledge and few (44.5%) had low knowledge about the Covid-19 vaccine (Fig 4.1). Most respondents (87.7%) believed COVID-19 vaccination, a small percentage (6.7%) did not, and 5.6% had



little to no understanding of the vaccine. The majority of respondents (56.0%) agreed that the COVID-19 vaccination is safe for use in all cancer patients, while 12.0% disagreed and 32.0% had no opinion on the matter. A majority of the respondents (47.5%) concurred that cancer patients should have priority access to the COVID-19 vaccine over the general public, while (20.5%) of the respondents disagreed on priority access to the vaccine for mostly cancer patients. Most respondents (41.1%) agreed that there can be common side effects/allergies to taking the vaccine, while (21.6%) disagreed that there are any side effects of the Covid-19 vaccine. A majority (40.0%) of respondents mentioned that the vaccines are not readily available or accessible for uptake, 34.4% said the COVID-19 vaccine can worsen the prognosis of cancer in cancer patients, 39.7% knew that uptake of the COVID-19 vaccine can contribute to the herd immunity of cancer patients and 68.3% of the respondents fully trust the recommendations of health care professionals about Covid-19 vaccines use. Also, 68.3% indicated their confusion about the various types and options of the COVID-19 vaccine, 41.9% did not understand whether or not the uptake of COVID-19 is a contradiction in cancer patients and 65.1% said they had sufficient information about the COVID-19 vaccine. Also, 55.2% of the respondents know that uptake of the COVID-19 vaccine can eradicate COVID-19 infections, while 25.3% were unsure about the potency of the vaccine to eradicate COVID-19 infections. 49.9% of the respondents did not know that access to the vaccine was possible without online enrollment. Some (12.8%) did not know that two doses of the COVID-19 vaccine are to be given 8-12 weeks apart as the recommended dosage, 53.1% knew that two doses of the COVID-19 vaccine are to be given 8-12 weeks apart as the recommended dosage. The majority of the respondents were aware of COVID-19 and respondent's sources of information on COVID-19 and its vaccine included the radio/television (28.3%), friends (25.9%), health workers (14.1%), social media (13.3%), hospitals (8.5%), personal experiences with COVID-19 infection (6.1%), and neighbors with (3.7%) (Fig 2). The mean vaccine usage score was 3.1 ± 1.6 . Among the specified vaccine options, Moderna emerges as the most preferred choice, with 36.3% of respondents indicating a preference for it, followed by Oxford-AstraZeneca (23.5%), Johnson & Johnson (20.3%), Pfizer-BioNTech (16.3%), and Covaxin (2.7%). A small percentage (1.1%) opted for other unspecified vaccines (Fig. 3).

Table 3: Knowledge on COVID-19-Vaccine Among Cancer Patients

Variable	Yes n (%)	No n (%)	Don't Know n (%)
Do you know about the COVID-19 vaccine?	329 (87.7)	25 (6.7)	21 (5.6)
COVID-19 vaccine is safe for all cancer patients	210 (56.0)	45 (12.0)	120 (32.0)
Cancer patients should be prioritized for COVID-19 vaccine over the general population	178 (47.5)	77 (20.5)	120 (32.0)
COVID-19 vaccine may cause mild side effects and allergies	154 (41.1)	81 (21.6)	140 (37.3)



COVID-19 vaccine is scarce/not readily available?	150 (40.0)	116 (30.9)	109 (29.1)
COVID-19 vaccine can worsen the prognosis of cancer?	129 (34.4)	107 (28.5)	139 (37.1)
COVID-19 vaccine will contribute to cancer patients' herd immunity	149 (39.7)	104 (27.7)	122 (32.5)
I trust the recommendations of health professionals on COVID-19 vaccine	256 (68.3)	66 (17.6)	53 (14.1)
I am confused about the various types/options of the vaccine	192 (51.2)	90 (24.0)	93 (24.8)
COVID-19 vaccine is contraindicated in cancer patients	146 (38.9)	157 (41.9)	72 (19.2)
I have sufficient information about COVID-19 vaccine	244 (65.1)	59 (15.7)	72 (19.2)
COVID- 19 vaccine may eradicate Covid-19 infection	207 (55.2)	73 (19.5)	95 (25.3)
To receive COVID- 19 vaccine, I have to enroll online	187 (49.9)	107 (28.5)	81 (21.6)
Two doses of COVID-19 vaccine to be given 8-12 weeks apart is recommended	199 (53.1)	48 (12.8)	128 (34.1)

Source: Field survey 2023

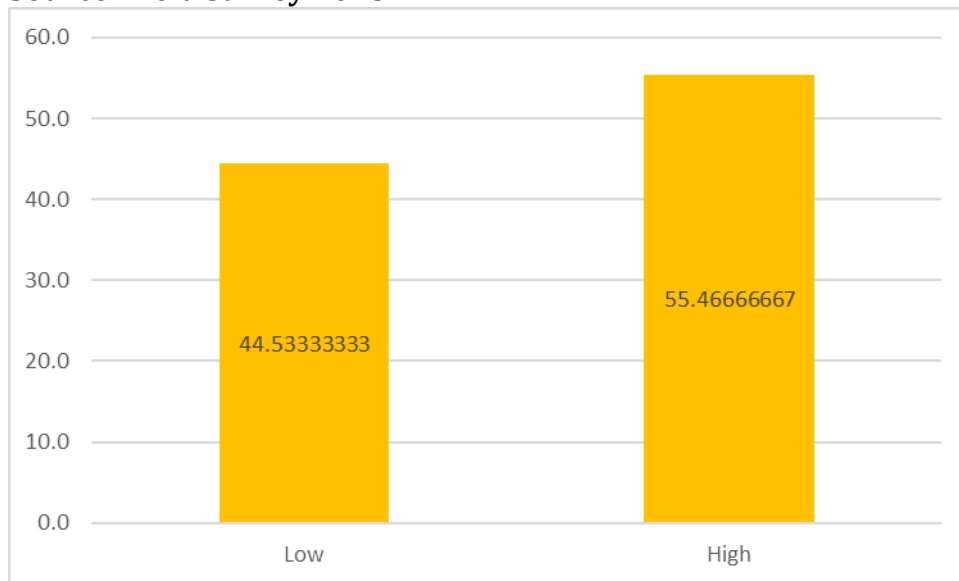


Figure 4.1 Level of Knowledge on COVID-19 Vaccine Among Cancer Patients



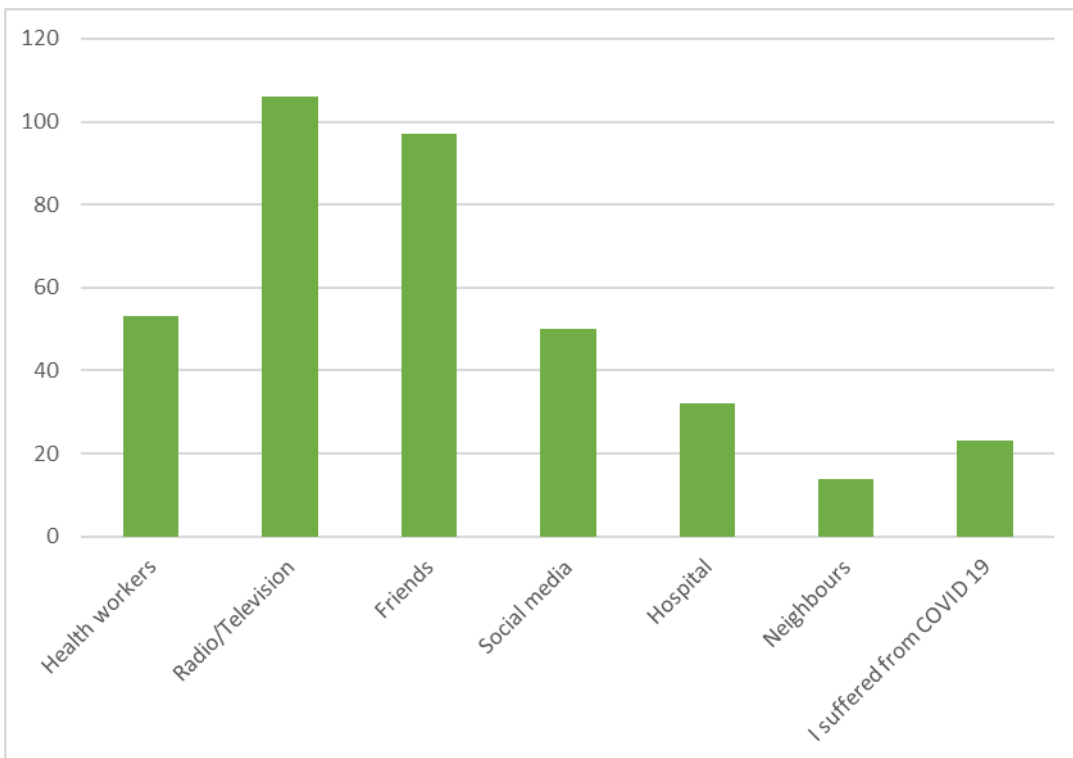


Figure 4.2 Sources of COVID-19 Vaccine Information among cancer patients

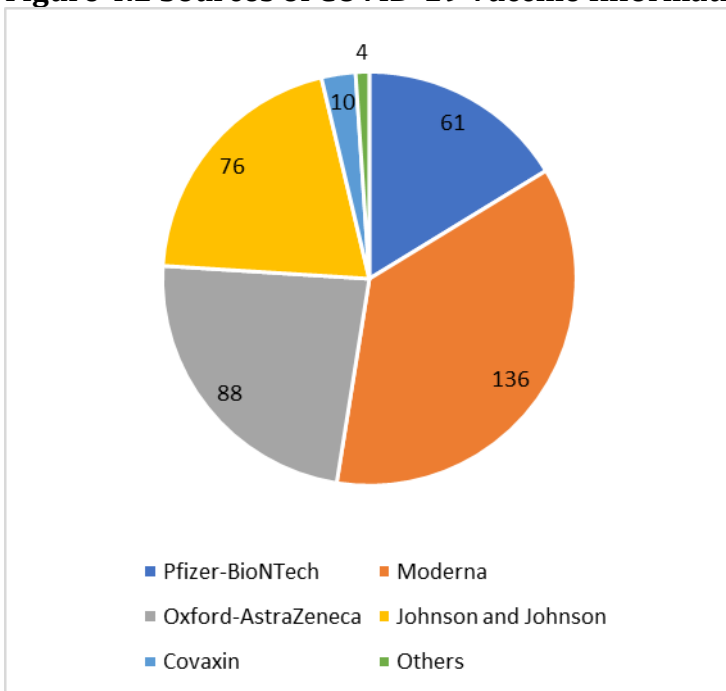


Figure 4.3 Current Usage of Approved COVID-19 Vaccines in Nigeria

Acceptance of COVID-19 Vaccine Among Cancer Patients

The mean acceptability score was 49.5 ± 7.0 . Notably, the findings indicate a balanced distribution, with 50% of participants demonstrating a high level of acceptability and the



remaining 50% exhibiting a lower level of acceptability towards COVID-19 and its vaccine amongst cancer patients (Fig 4.4). More than half (56.0%) showed willingness to take the COVID-19 vaccine and 47.5% strongly agreed that all cancer patients on treatment can take the COVID-19 vaccine. However, some (28.5%) disagreed that the COVID-19 vaccine is legally mandatory for all cancer patients. Some, 35.5% of the respondents said they need the COVID-19 vaccine more than the general population, 50.9% agreed that the vaccine is well tolerated and 25.9% were unsure of the effectiveness of the vaccine on COVID-19 infections. Also, 62.4% of the respondents fully trust the recommendations of health professionals on COVID-19 vaccine, and 21.1% disagreed that the Covid-19 vaccine is available free of charge. The majority (66.9%) said their healthcare professionals had recommended the uptake of the vaccine to them, and 14.9% disagreed on whether pharmaceutical companies are capable of developing safe and effective COVID-19 vaccines for use. Significantly, 66.7% of the respondents showed trust in the science and development process of the vaccines, 25.1% disagreed on whether or not the benefits of taking the COVID-19 vaccine outweigh the risks involved with no adherence, 14.1% strongly agreed that they have confidence in the vaccine's effectiveness and safety and 19.2% disagreed on level of trust in the government and health systems.

Table 4 Acceptance of COVID-19 vaccine among cancer patients

Variables	Yes n (%)	No n (%)	Not sure n (%)
Have you taken the COVID-19 vaccine before?	283 (75.5)	77 (20.5)	15 (4.0)
Are you willing to take	210 (56.0)	81 (21.6)	84 (22.4)
All cancer patients can receive COVID-19 vaccine	178 (47.5)	51 (13.6)	146 (38.9)
Cancer patients on treatment can take COVID-19	165 (44.0)	58 (15.5)	152 (40.5)
COVID-19 vaccine is legally mandatory for all cancer patients	119 (31.7)	107 (28.5)	149 (39.7)
COVID-19 vaccine should be mandated on all cancer patients	141 (37.6)	95 (25.3)	139 (37.1)
I need the vaccine more than other people do	133 (35.5)	119 (31.7)	123 (32.8)
COVID-19 vaccine does not interfere with my treatment	191 (50.9)	62 (16.5)	122 (32.5)
I think it is well-tolerated	191 (50.9)	88 (23.5)	96 (25.6)
I am fully confident that the vaccine is effective	234 (62.4)	44 (11.7)	97 (25.9)



I trust the recommendations of health professionals on COVID -9 vaccine	234 (62.4)	73 (19.5)	68 (18.1)
COVID-19 vaccine is available free of charge	198 (52.8)	79 (21.1)	98 (26.1)
My healthcare professional has recommended the vaccine	251 (66.9)	60 (16.0)	64 (17.1)
Pharmaceutical companies are capable of developing safe and effective COVID-19 vaccines	201 (53.6)	56 (14.9)	118 (31.5)
I have trust in the science and vaccine development process	250 (66.7)	52 (13.9)	73 (19.5)
There is sufficient data regarding the vaccine safety and efficacy released by the government	226 (60.3)	58 (15.5)	91 (24.3)
I believe the benefits of taking the COVID-19 vaccine outweighs the risks involved	212 (56.5)	69 (18.4)	94 (25.1)
COVID-19 vaccines does not interfere with my treatment	184 (49.1)	60 (16.0)	131 (34.9)
Cancer patients need the vaccine more than other people	185 (49.3)	40(10.7)	150 (40.0)
I have confidence in the vaccine's effectiveness and safety	244 (65.1)	53 (14.1)	78 (20.8)
I have trust in the government and the health system	244 (65.1)	72 (19.2)	59 (15.7)

Source: Field Survey, 2023



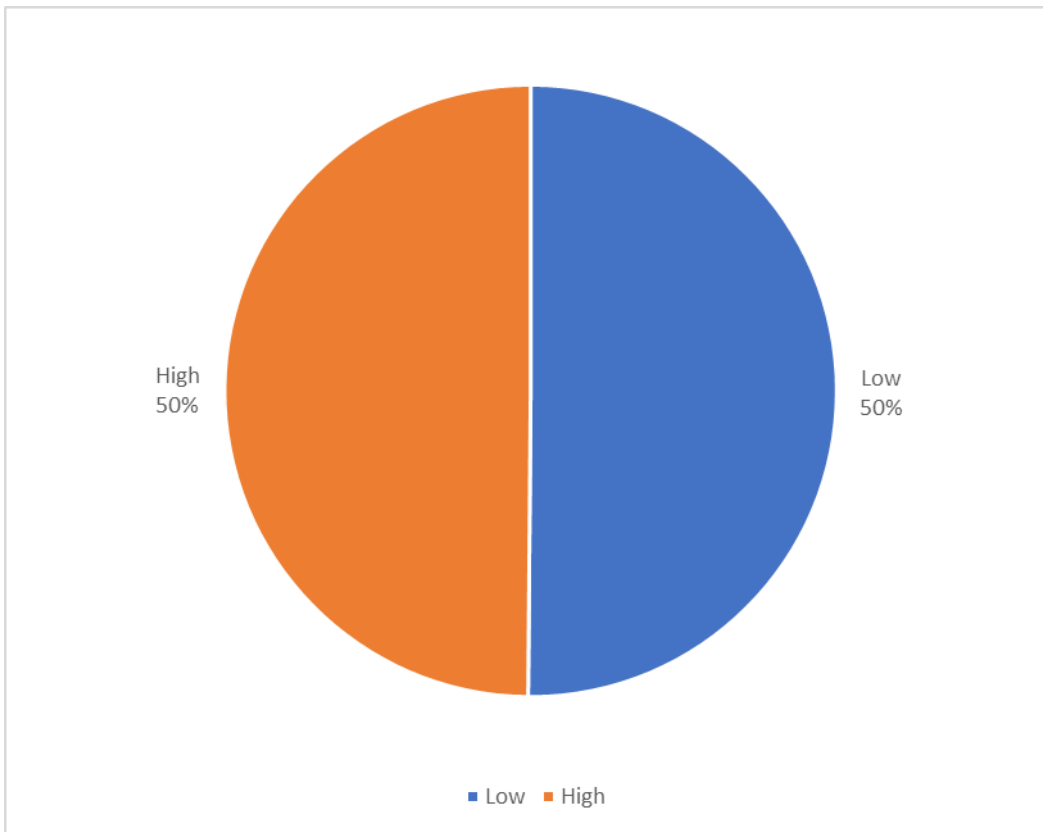


Figure 4.4 Acceptance of COVID-19 vaccine among cancer patients

Association between Knowledge and Acceptance Rate

Chi-square analysis showed that there was a statistically significant association between knowledge and the level of acceptability of the COVID-19 vaccine among cancer patients ($X^2=27.592$; $p = 0.000$). We therefore reject the null hypothesis (Table 5).

Table 5 Association between Knowledge and Acceptance rate

Variables	Level of Acceptability		df	X ²	p-value	Remarks
	Low n (%)	High n (%)				
Knowledge						
Low	109 (83.7)	58 (83.3)	1	27.592	0.000	Significant
High	79 (104.3)	129 (103.7)				

Source: Field Survey, 2023



Discussion

The study's results provide insight into the evolving context of cancer patients' acceptance of the COVID-19 vaccination in several teaching institutions in South-West Nigeria. Our investigation into the determinants of vaccine acceptance has discovered many significant criteria that influence cancer patients' willingness to receive the COVID-19 immunisation in light of their cancer diagnosis. The average age of cancer patients was 43.4 ± 12.0 years, comparable to 40.8 ± 12.2 years reported by (Adedeji-Adenola et al. 2022), likely due to both studies being done in Nigerian states. A portion of the respondents (36.0%) were aged 40-49, much lower than the 47.8% reported by (Eze et al., 2021). A significant proportion of the respondents were female, similar to the research conducted by (Ruthrich et al. 2021), likely due to both studies using healthcare facilities for their study populations. The majority of respondents were Yoruba, which is anticipated given that the research region was located in largely Yoruba-speaking states. In this study, 53.1% were married, which is lower than the 79.2% reported by (Ruthrich et al. 2021), maybe due to differences in the study populations. The majority of respondents were cognisant of COVID-19, with their sources of information regarding the virus and its vaccine comprising radio/television (28.3%), friends (25.9%), health workers (14.1%), social media (13.3%), hospitals (8.5%), personal experiences with COVID-19 infection (6.1%), and neighbours (3.7%). Additionally, a portion of the respondents (38.9%) credited their understanding of the illness and the vaccination to media exposure, which may explain the deficiency in vaccine awareness and the prevalence of misconceptions about its advantages and significance to public health. This study indicates that 44% of the respondents were cancer patients diagnosed with breast cancer, in contrast to 77% reported in a study conducted by (Adedeji-Adenola et al. 2022), maybe attributable to the larger sample size used in that research. A survey conducted by ¹⁹ among cancer patients identified lung cancer as the most prevalent form (25.0%), followed by oesophageal cancer (14.3%) and breast cancer (10.7%). All (87.7%) of the respondents in this research have a substantial understanding of COVID-19. This study found that most respondents believed cancer patients should be prioritised for the COVID-19 vaccine over the general population, corroborating the findings of (Ruthrich et al. 2021), which indicated that COVID-19-related mortality was higher and survival rates lower in cancer patients compared to non-cancer patients. As anticipated, a similar observation was seen with ICU patients. Mortality rates corresponded with findings by (Syed-Alwi et al. 2021) indicating 28% for non-ICU patients and 41% for those in critical care units. A portion of the respondents (34.4%) indicated medium to high degrees of adverse effects of COVID-19 on cancer treatment. This indicates inadequate patient satisfaction, which may adversely affect both physical and mental health-related quality of life, diminish treatment adherence, and lower the willingness to pursue therapy, ultimately leading to suboptimal results. The outcomes of this research reveal an even distribution, with 50% of participants showing a high degree of acceptance and the other 50% displaying a lesser level of acceptability for COVID-19 and its vaccination among cancer patients. A significant number of respondents demonstrated high levels of knowledge on COVID-19, perhaps due to the predominance of those possessing at least a secondary education. The COVID-19 vaccination acceptance percentage in this research (56.0%) was



comparable to the findings of ²¹ where only 50.2% and 51.1% of Nigerians expressed willingness to get the COVID-19 vaccine, respectively.

Nonetheless, the vaccine acceptance rate was inferior to the 76% COVID-19 vaccination acceptance rate among Nigerians documented by the African Centre for Disease Control (Africa CDC) in their 15-country COVID-19 vaccine perception survey conducted in 2021 (WHO, 2021). Public trust is an essential element of any effective COVID-19 vaccine acceptance initiative. Moderna is the most favoured vaccination alternative, with 36.3% of respondents expressing a preference, followed by Oxford-AstraZeneca at 23.5%, Johnson & Johnson at 20.3%, Pfizer-BioNTech at 16.3%, and Covaxin at 2.7%. A minor fraction (1.1%) selected alternative, unnamed vaccinations. Our study revealed that 34.4% of respondents did not believe that vaccine uptake could exacerbate their cancer prognosis, which indicated that cancer patients exhibit a diminished likelihood of mounting an effective immune response following COVID-19 vaccinations compared to individuals without the disease. Our results indicated that the acceptability of the COVID-19 vaccination in Southwestern Nigeria (65.1%) was highly affected by respondents' perceptions, particularly their faith in the government. Similar findings were reported by (Tobin et al. 2021; Al-Mohaithef and Padhi 2020), indicating that trust in the government significantly enhanced the probability of COVID-19 vaccine acceptance and adherence to other COVID-19 control measures in Saudi Arabia and the United States, respectively. Respondents who evaluated the government's management of the pandemic were 2.25 times more likely to accept the vaccine.

The research of Ogunrinde and Gbenga-Epebinu (2020) indicates that an increase in cancer patients' knowledge correlates with a higher propensity to receive the vaccination. Our findings indicate that cancer patients who possess comprehensive knowledge about the COVID-19 vaccine are more likely to recognise its advantages, effectiveness, and significance in safeguarding them against severe illnesses, particularly due to their already weakened immune systems²⁵. This aligns with the conclusions of Eze et al. (2021), which emphasised that vaccine education provided by individuals well-versed in the net benefits of vaccination against SARS-CoV-2 is crucial in addressing the hesitancy prevalent in the general Nigerian population.

Conclusion

The study revealed that a majority of the respondents had a good knowledge of COVID-19 and the benefits of the vaccine to cancer patients. Also, most had a high level of acceptability of the vaccine.

Recommendations

Based on the findings of the research, the following recommendations were made;

1. There is a need for the formulation of policies encouraging the prioritization of the COVID-19 vaccine among cancer patients.
2. Provide healthcare workers with training and resources to effectively communicate with cancer patients about COVID-19 vaccination. Promote patient-focused treatment, and assist medical professionals in listening to patients' worries and providing support.

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