


Communicating COVID-19 Vaccine Safety: Knowledge and Attitude Among Residents of South East, Nigeria

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Background: The fight against the coronavirus disease (COVID-19), which has continued to threaten human existence globally, has led to the development of vaccines in order to control the rate of infection and death associated with the disease. Media messages on the COVID-19 vaccine are geared towards raising audience awareness and understanding of health risks, knowledge and attitudes about the vaccine safety.

Objective: The study examined the knowledge and attitude towards COVID-19 vaccine safety media messages amongst residents of South East, Nigeria.

Methods: A cross-sectional descriptive study was conducted among 399 respondents (18–47 years) in both urban and rural communities of South East, Nigeria from May 6th to July 4th, 2021. The survey was carried out using structured self administered questionnaire containing the respondents' demographics, knowledge and attitudes towards media messages regarding COVID-19 vaccine safety. The data were analysed using the SPSS version 26 software. Result was presented in frequencies, percentages and charts showing the inter-relatedness of the variables examined. Regression ANOVA was used to test hypotheses on the extent to which level of exposure to COVID-19 media messages predict their knowledge and attitude towards COVID-19 vaccine safety at $P < 0.05$ level of significance.

Results: Data indicate respondents are apprehensive of taking the COVID-19 vaccine. Approximately, 91% of respondents are between the ages of 18 and 27 years. Meanwhile, 26.1% of the respondents agreed that media messages on COVID-19 vaccine is very assuring and convincing as regards human safety; 42.4% disagreed on the safety of COVID-19 vaccine safety messages; 26.1% rated vaccine messages as moderate as regards human safety, while 5.5% rated the vaccine messages as poor. Knowledge of respondents regarding the safety of the vaccine was low and respondents' attitude was negative in South East, Nigeria. The implication is indicative of the failure of the main stream media in educating the general public on pertinent health issues relevant to them.

Conclusion: Knowledge regarding media messages on COVID-19 vaccine safety is low. Messages on COVID-19 vaccine safety were not sufficient and convincing. Consequently, there is a negative attitude towards the vaccine. Hence, improving knowledge and adoptive attitude amongst respondents amidst COVID-19 is critical.

Keywords: COVID-19, vaccine, safety, knowledge, attitude, media advocacies

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Introduction

The challenges posed by the novel coronavirus pandemic since late 2019 till date are one of the worst health challenges recorded after the 1918–1920 flu pandemic that claimed over 100 million lives globally.¹ Coronavirus (COVID-19) is an illness of severe Acute

Respiratory Syndrome caused by a novel coronavirus² and has become a major public health concern.³ The disease is transmitted through saliva and mucus droplets from an infected person. The symptoms of the COVID-19 infection are similar to that of other beta coronaviruses.⁴ Symptoms include fever, cough, dyspnea, weakness and fatigue, headache and diarrhea.⁵ COVID-19 disease is posing a great global public health threat in our world today since the first quarter of 2020. The catastrophic news of the Corona-virus, which has claimed thousands of lives around the world, has had a tsunami effect on every nation in the first quarter of 2020, halting all global economies^{6,7} without any notice or foresight from scientists and defying all scientific strength. Infected patients died at a higher rate, especially among the elderly who had underlying diseases such as cancer, diabetes, chronic respiratory disorders, acute cough, and so on.^{8,9} Despite the fact that COVID-19 had an effect on almost every continent on the planet, climatic conditions played a significant role in determining the pandemic's global impact, taking into account the unique characteristics of each region.¹⁰ However, regardless of race or age, the disease's symptoms were the same. Death rates were being reported at breakneck pace in the newspapers, making it an especially trying time in human history.¹¹

COVID-19's rapid spread is being investigated at all levels of human endeavor due to its grave consequences for all people affected across the world. The spread of COVID-19 is now relentless in almost all the countries of the world including Nigeria, causing serious public health, social and economic upheaval.^{12–14} The mere surface of this pandemic, defying all scientific prowess, has plunged the entire planet into chaos.¹⁵ This conundrum necessitates a well-defined sequence and methodology that allows for adequate documentation of those impacted at all levels by the disease's global impact. This, too, necessitates a strategic approach, especially in the case of disadvantaged groups of all kinds.¹⁶ Data have it that millions of people are still dying daily irrespective of the availability of the World Health Organisation COVID-19 vaccine endorsement. The COVID-19 pandemic has created a new reality in which people are confronted with a previously unknown disease and its consequences, providing a unique opportunity to study vaccine attitudes at a time when disease awareness is high.¹⁷

Vaccines are the most important public health measure¹⁸ and most effective strategy for controlling diseases in many countries around the world.^{19,20} Moreover, the distribution of vaccines is highly significant in order to analyze community acceptance of COVID-19 vaccines.²¹ All these call for a concerted effort to arrest the pandemic.

Hence, there is a need to encourage the COVID-19 vaccination to reduce the propagation rate.

Ironically, the fear of death arising from COVID-19 disease and other controversies surrounding the vaccine safety in different parts of the world has increased fears in many Nigerians recently. Unfortunately, the approved COVID-19 vaccine seems not to guarantee safety as many have anticipated. It seems many people are not too eager to be vaccinated owing to the acclaimed side effects some health tips suggest such as myocarditis and Pericarditis associated with Pfizer and Moderna vaccine.

Consequently, spread of messages by the media^{22–24} through multiple channels²⁵ have deliberately tried to douse fears and uncertainty regarding the vaccine safety. People tend to be more careful especially with the news of health complications resulting from those who have already taken the COVID-19 vaccine, especially the speculations that the vaccine alters ones "DNA".²⁶ This is in addition to social media videos demonstrating the magnetic and lighting potency of vaccines if injected area of someone is touched with metal or electric bulb as the case may be. Similarly, effective communication to create confidence and reduce public ambiguity is critical for promoting vaccination acceptability, willingness, and uptake, avoiding vaccine hesitancy, and dealing with any infodemic on the topic, such as in the case of COVID-19 vaccines.^{27–32} has turned out to be unsuitable in addressing the issue. More so, it appears the body language of many Nigerians show likelihood and tendency of rejecting the vaccine even if it is made compulsory by the government.³³ Researchers have adduced reasons behind spreading of rumors, fake news, refusal of vaccine acceptance and vaccine hesitancy globally with regard to COVID-19 vaccine.^{34–38} Thus, reasons such as: Vaccine susceptibility, risk perception, and reaction^{39–44} certain religious beliefs, lack of knowledge and awareness.^{45–49} Likewise other reasons from Nigeria setting and other countries, such as poor health literacy^{50,51} conflicts and insecurities,⁵² distrust in governments and firms that manufacture the vaccines^{49,53–59} remain a serious challenge.

There seems to be obvious speculation suggesting that many people in South-east geo-political zone still doubt the integrity of the COVID-19 vaccine in circulation currently. Respondents in this terrain still think of COVID-19 as propaganda. The vaccine is often referred to as a "trial vaccine" by many people.¹¹ The current status of Nigeria health care delivery discourages her citizens from even trusting on the integrity of the COVID-19 vaccine. Past research efforts indicated that people's reluctance to receive the vaccine

was caused by their anxiety and uncertainty about it.^{41,49,57,60–62} Future health education initiatives should focus on enhanced understanding about COVID-19 via mass media messaging and cues from health-care practitioners' recommendations to promote vaccine uptake by identifying a determinant that influences the intention to have the COVID-19 immunization.^{59,63,64}

Materials and Methods

A cross-sectional descriptive study was conducted among 399 respondents (18–47 years) in both urban and rural communities of Enugu State, Ebonyi State and Anambra State in South East region Nigeria from May 6th, to July 4th, 2021. The survey was carried out using structured questionnaire containing the respondents' demographics, knowledge and attitudes towards media messages regarding COVID-19 vaccine safety. The Online Scientific sample size determination Australian calculator was used to select the sample size of 399.

Measurement

The data were analysed using the SPSS version 26 software. Result was presented on frequency tables, percentage and charts showing the interrelatedness of the variables examined. Regression ANOVA was used to test hypotheses on the extent to which the level of exposure to COVID-19 media messages predict their knowledge and attitude towards COVID-19 vaccine safety at $P < 0.05$ level of significance.

Result

The result of the study as presented in Table 1 shows the distribution of respondents by age, gender, religion, educational qualification and occupation. Result shows that majority of the respondents were between the age range of 28–37 representing 47.9%, while those within the age range of 18–27 and 38–47 were represented by 26.6% and 25.6%, respectively. Result also shows that 60.9% of the respondents are male while 39.1% are female. Also, result shows that 94.5% of the respondents were Christians while only 5.5% were Muslims. The reason for the high number of Christians is due partly to the fact that the area in which the study was carried out is dominated by Christian religion. On Qualifications, result shows that 26.6% are holders of B. Sc, 57.9% are with M.Sc while 15.5% are Ph.D holders. On Occupation, 26.6% are working class people, 16% are business men and women, 10.3% are unemployed while 47.1% of the respondents are students.

Table 1 Demographic Information of Respondents

		Frequency	Percentage
Age (in years)	18–27	106	26.6
	28–37	191	47.9
	38–47	102	25.6
	48 Yrs and above	–	–
Gender	Male	243	60.9
	Female	156	39.1
Religion	Christianity	377	94.5
	Islam	22	5.5
Qualification	SSCE	–	–
	B.Sc	106	26.6
	M.Sc	231	57.9
	Ph.D	62	15.5
Occupation	Working Class	106	26.6
	Business Person	64	16.0
	Unemployed	41	10.3
	Student	188	47.1

Respondents Level of Exposure to Media Messages on COVID-19 Vaccine Safety in South East, Nigeria

How Would You Rate the Media Messages on COVID-19 Vaccine?

Result in Figure 1 shows the respondents' rating on media messages on COVID-19 vaccine safety. Result shows that 42% of the respondents rated the media message on COVID-19 vaccine safety as moderate, 32% rated it as very well, 21% rated adequate while only 5% were ignorant (ie, having no knowledge of media messages on COVID-19 vaccine safety). The finding of the study therefore shows that about 95% of the respondents are exposed media messages on COVID-19 vaccine safety in South east, Nigeria.

What Risks of COVID-19 Vaccine Threatens You Most?

Result on Table 2 shows that majority of the respondents are threatened on COVID-19 vaccine because of slow recovery (64.9%), while 24.8% are threatened because of death complications and 10.3% of the respondents are threatened because of lack of hospital incentives. This implies that the respondents are exposed to media messages on COVID-19

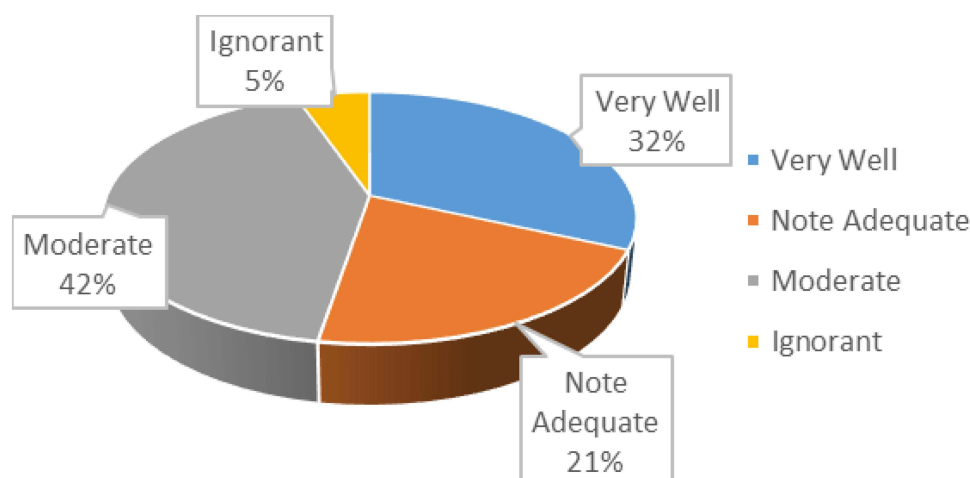


Figure 1 Pie chart showing respondents' rating of media messages on COVID-19 vaccine safety.

Vaccine safety but are threatened by death complications, slow recovery and no hospital incentives.

How Frequent Do You Get Messages on COVID-19 Vaccine?

The result in [Figure 2](#) shows that 37.1% of the respondents get media messages on COVID-19 vaccine regularly, 47.1% get it occasionally while 15.8% get media messages on COVID-19 Vaccine safety rarely. This implies that majority of the respondents are exposed to media messages on COVID-19 vaccine safety.

How Would You Score Media Commitment to COVID-19 Vaccine Messages?

Result on [Figure 3](#) shows that 11% of the respondents rated media commitment to COVID-19 vaccine messages as excellent, 26% rated it as very good, 42% rated it as moderated and 21% rated media commitment to COVID-19 vaccine messages as poor. These ratings indicate that

the respondents are exposed to media messages on COVID-19 vaccine safety.

What Media Platform Do You Get COVID-19 Vaccine More?

Result on [Table 3](#) shows that 26.3% of the respondents get COVID-19 vaccine messages through the radio, 21.8% get through Television (TV), 35.3% get the messages through social media and 16.5% get the messages through friends and family. This result shows that respondents are exposed to media messages on COVID-19 vaccine safety.

Do You Think Media Messages on COVID-19 Vaccine is Very Assuring and Convincing Human Safety?

Result on [Table 4](#) shows that 26.1% of the respondents agreed that media messages on COVID-19 vaccine is very assuring and convincing as regards human safety; 42.4% disagreed on the safety of COVID-19 vaccine messages; 26.1% rated COVID-19 vaccine messages as moderate as regards human safety while 5.5% rated the vaccine messages as poor. Based on the responses, it is obvious that the respondents are exposed to media messages on COVID-19 vaccine safety.

Do You Think Medical Personnel's in Nigeria are Well Equipped to Handle Patients While Injecting Them with the COVID-19 Vaccine?

The result in [Figure 4](#) shows that 48.4% of the respondents disagreed that medical personnel in Nigeria are well

Table 2 Frequency and Percentages of Respondents' Responses on Risks of COVID-19 Vaccine

S/N	Responses	Frequency	Percentage
1	Death complications	99	24.8
2	Slow recovery	259	64.9
3	No hospital incentives	41	10.3
	Total	399	100.0%

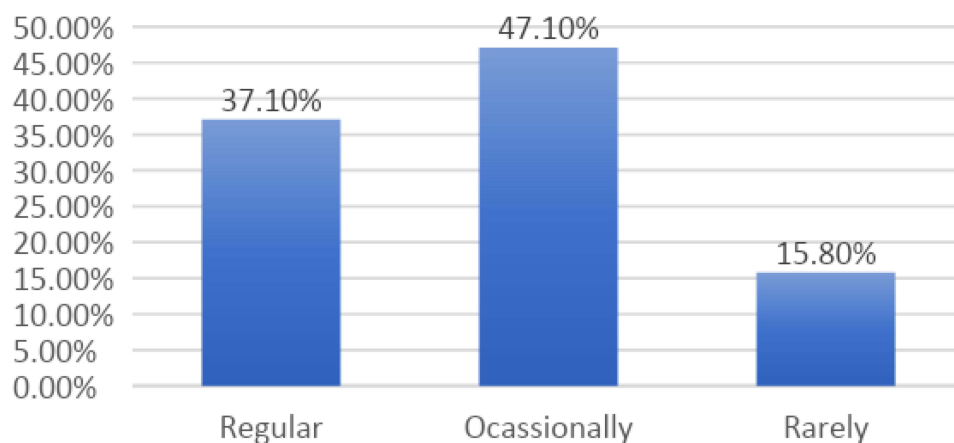


Figure 2 Bar chart showing the frequency of media messages on COVID-19 vaccine safety.

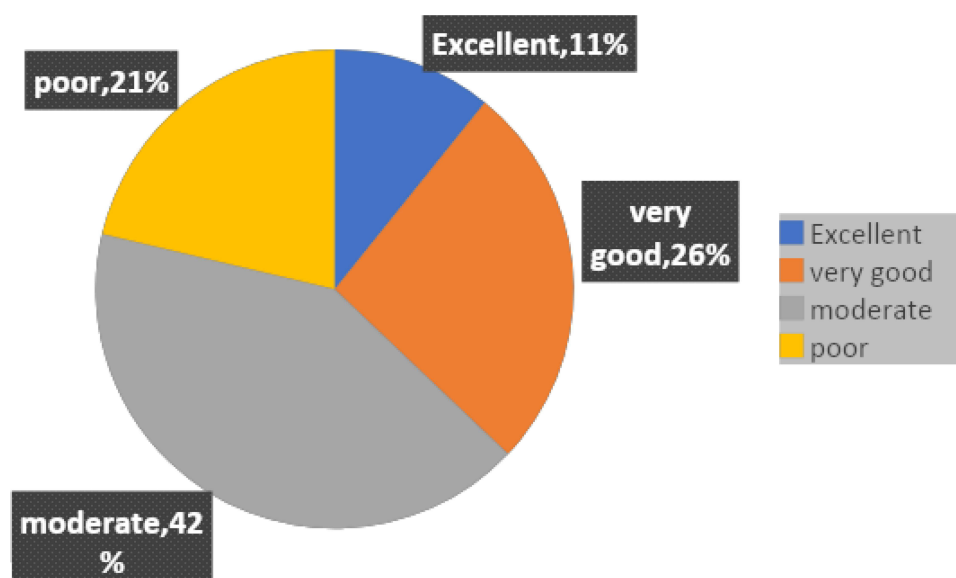


Figure 3 Pie chart showing media commitment to COVID-19 vaccine messages.

equipped to handle patients while injecting them with the COVID-19 vaccine; 30.6% are skeptical, 10.5% of the respondents agreed that medical personnels in Nigeria are well equipped to handle patients while injecting them with the COVID-19 vaccine while 10.5% rated medical personnel as being very poor with regard to whether they are well equipped to handle patients while injecting them with the COVID-19 vaccine. One can conclude from the ratings that the respondents are exposed to media messages on COVID-19 safety messages.

Knowledge on COVID –19 Vaccine Safety

The result of the study on Table 5 shows that majority of the respondents (53.1%) did not know about the safety of

the COVID-19 vaccine while 36.1% of the respondents are not sure of the safety of the vaccine and only 10.8% of the respondents know about the safety of COVID-19 vaccine. On whether the respondents know anything about efficacy of the COVID-19 vaccine, 21.6% said Yes, 42.4% said No while 36.1% are not sure. On whether the respondents know COVID-19 vaccine have side effect, 52.9% said yes, 26.6% said no and 20.6% of the respondents are not sure. Also, on whether the COVID-19 vaccine has different versions, 47.6% said Yes it has, 29.6% said No it has no different versions and 22.8% are not sure yet. Finally, on whether the respondents know that the government can mandate citizens to be vaccinated, 10.8% said yes, 84.2% said no that the government should not mandate citizens to take the vaccine and 5% are not sure. Based on the

Table 3 Percentages of Respondents on Media Platform COVID-19 Vaccine Messages are Gotten

S/N	Responses	Frequency	Percentage
1	Radio	105	26.3
2	TV	87	21.8
3	Social media	141	35.3
4	Friends and Family	66	16.5
	Total	399	100.0%

Table 4 Percentages of Respondents on Whether Media Messages on COVID-19 Vaccine is Very Assuring and Convincing as Regards Human Safety

S/N	Responses	Frequency	Percentage
1	Yes	104	26.1
2	No	169	42.4
3	Moderate	104	26.1
4	Poor	22	5.5
	Total	399	100.0%

findings of this study, there is indication that the respondents have little knowledge of COVID-19 vaccine safety. The overall finding of the study shows that 28.72% of the respondents are knowledgeable about COVID-19 vaccine safety, 47.17% of the respondents have no knowledge about the vaccine safety and 24.11% of the respondents are not sure yet. This implies that the knowledge level of respondents on the safety of COVID-19 vaccine is low.

Attitudes Towards COVID-19 Safety Vaccine Messages

The result of the study on Table 6 shows that 16% of the respondents said the vaccine should be made compulsory

by the government, 63.4% said no, while 20.6% are not sure. On whether the respondents think their family members should be vaccinated, 16% said yes, 67.2% said no, while 16.8% are not sure. Result also shows that 20.6% of the respondents said that COVID-19 vaccine have cultural implications, 32.3% said no, while 47.1% of the respondents are not sure about the cultural implication of the vaccine. On whether religious belief of the respondents contradicts COVID-19 vaccination, 5.3% said yes, 79.4% said no and 15.3% are not sure. Lastly, 21.6% of the respondents said yes that they will like to encourage their friends to take the COVID-19 vaccine, 58.1% said no while 20.3% of the respondents are not sure whether they will like to encourage their friends to take the COVID-19 vaccine. Result on attitude of respondents towards the safety of COVID-19 vaccine, 15.89% of the respondents said yes, they think the vaccine is safe, 60.10% said no, they think the vaccine is not safe and 24.01% of the respondents are not sure. Based on the findings of this study, the researchers conclude that the respondents think COVID-19 vaccine is not safe.

Hypotheses

H₀₁: Respondents' level of exposure to COVID-19 media messages will not significantly predict their knowledge on COVID-19 vaccine safety.

Result on whether the respondents' level of exposure to COVID-19 media messages will not significantly predict their knowledge on COVID-19 vaccine safety showed that an f-ratio of ($F(1, 398) = 67.77, p = 0.00$) was obtained. Since the associated probability value (p-value) of 0.00 is

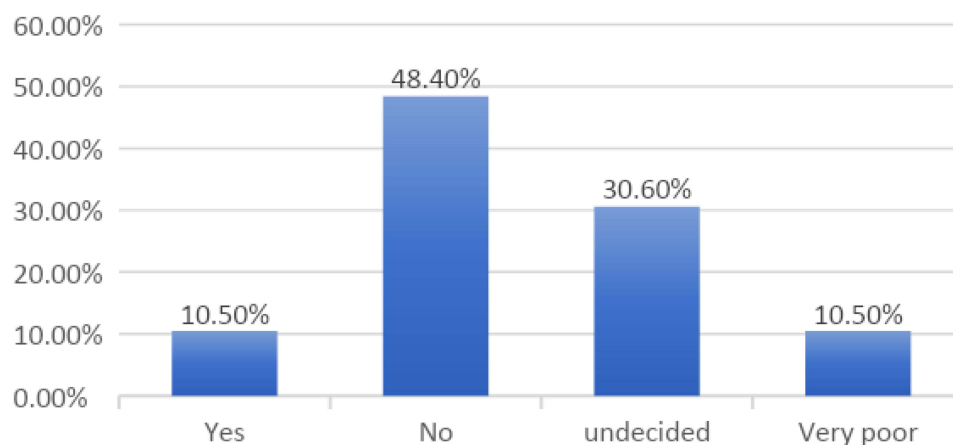
**Figure 4** Bar chart showing the responses of respondents on whether medical personnel in Nigeria are well equipped to handle patients while injecting them with the COVID-19 vaccine.

Table 5 Frequency and Percentages of Respondents on COVID-19 Vaccine Safety

S/N	Statements	Yes		No		Not Sure	
		Freq.	%	Freq.	%	Freq.	%
1	Do you know about the safety of COVID-19 vaccine?	43	10.8	212	53.1	144	36.1
2	Do you know anything about the efficacy of the vaccine?	86	21.6	169	42.4	144	36.1
3	Do you know COVID-19 vaccine have side effects?	211	52.9	106	26.6	82	20.6
4	Do you know the vaccine have different versions?	190	47.6	118	29.6	91	22.8
5	Do you know government can mandate citizens to be vaccinated?	43	10.8	336	84.2	20	5.0
	Total	573	28.72	941	47.17	481	24.11

Table 6 Frequency and Percentages of Respondents' Attitude Towards COVID-19 Vaccine Safety

S/N	Statements	Yes		No		Not Sure	
		Freq.	%	Freq.	%	Freq.	%
1	Do you think the vaccine should be made compulsory by the government?	64	16.0	253	63.4	82	20.6
2	Do you think your family members should be vaccinated?	64	16.0	268	67.2	67	16.8
3	Do you think COVID-19 vaccine have cultural implication?	82	20.6	129	32.3	188	47.1
4	Do you feel your religious belief contradict COVID-19 vaccination?	21	5.3	317	79.4	61	15.3
5	Would you like to encourage your friends to take the COVID-19 Vaccine?	86	21.6	232	58.1	81	20.3
	Total	317	15.89	1199	60.10	479	24.01

less than 0.05 level of significance at which the result is being tested, the null hypothesis is not accepted and inference drawn is that respondents' level of exposure to COVID-19 media messages is a significant predictor of their knowledge on COVID-19 vaccine safety. This means that exposure to COVID-19 media messages can significantly predict the extent to which the masses will accept that COVID-19 vaccine is safe.

H₀₂: Respondents' level of exposure to COVID-19 media messages will not significantly predict their attitude towards COVID-19 vaccine safety.

In order to test hypothesis two, result shows that an f-ratio of ($F(1, 398) = 19.67, p = 0.00$) was obtained. Since the associated probability value (p-value) of 0.00 is less than 0.05 level of significance set for testing the hypothesis, this means that the null hypothesis is not accepted. Inference drawn therefore is that respondents' level of exposure to

COVID-19 media messages is a significant predictor of their attitude towards COVID-19 vaccine safety. This equally implies that exposure to COVID-19 vaccine safety media messages can significantly predict attitude of masses towards accepting that COVID-19 vaccine is safe.

Discussion

The study aimed at assessing the knowledge and attitude of residents of south-east, Nigeria towards COVID-19 vaccine safety. Results show that majority (95%) of the respondents were exposed to media messages on COVID-19 vaccine safety in varying degrees in South east, Nigeria. While 42% were moderately exposed, 32% were well exposed and 21% were adequately exposed to the vaccine safety messages. Only 5% of the respondents were ignorant of the messages.

Findings of the current study regarding the source of exposure indicate that majority of the respondents were

exposed to vaccine safety messages through the social media 35%, radio 26.3%, television 21.8%, 16.5% of the respondents who were exposed to COVID-19 vaccine safety messages through friends and families. The reason for social media been the dominant sources of the vaccine messages is not farfetched bearing in mind the popularity of the social media for information dissemination in contemporary times. The study also collaborates with the study of Zeballos et al⁴⁴ which found that social media exposure to COVID-19 information influences the adoption of preventive attitudes and behaviors through shaping risk perception.

This is in contrast with the study conducted by Al-Marshoudi et al²⁵ in Omani community's which found that their willingness to take COVID-19 vaccine can be enhanced by utilizing social media and community influencers to spread awareness about the vaccine's safety and efficacy. The result of this study indicates that the knowledge level of respondents on the safety of COVID-19 vaccine is low. Only 28.72% of the respondents are knowledgeable about COVID-19 vaccine safety messages. Respondents' level of exposure to COVID-19 media messages is a significant predictor of their knowledge on COVID-19 vaccine safety. The study is similar to the findings of Islam et al²⁰ that indicated inadequate knowledge but more positive attitudes towards COVID-19 vaccine among the general population in Bangladesh. Also, another study by Mesesle³ in Ethiopia indicated poor knowledge towards COVID-19 vaccine. This means that exposure to COVID-19 media messages can significantly predict the extent of respondents' knowledge towards the safety of COVID-19 vaccine.

The findings on attitude of the respondents towards the safety of COVID-19 vaccine show that majority of the respondents (60.10%) think that the vaccine is not safe. Respondents' level of exposure to COVID-19 media messages is a significant predictor of their attitude towards COVID-19 vaccine safety. This equally implies that exposure to COVID-19 media messages can significantly predict attitude of respondents towards COVID-19 vaccine safety. The study is in agreement with Fridman et al¹⁷ study that found a decline in general vaccine attitudes and intentions of getting the influenza vaccine. In addition, certain characteristics of the COVID-19 vaccines themselves like efficacy, safety, and side effects influence public attitudes.³⁸

Conclusion

Knowledge regarding media messages on COVID-19 vaccine safety is low. Messages on COVID-19 vaccine safety

were not sufficient and convincing. Consequently, there is a negative attitude towards the vaccine. Respondents' level of exposure to COVID-19 media messages is a significant predictor of their knowledge and attitude on COVID-19 vaccine safety. Hence, improving knowledge and adoptive attitude amongst respondents amidst COVID-19 is critical.

Data Sharing Statement

The data presented in this work are with the authors and will be made available on request.

Ethics Approval and Consent to Participate

Ethical clearance was obtained from the Faculty of Arts Research Ethics Committee University of Nigeria, Nsukka with reference No UN/FA/FAREC/02232021. All participants involved in this study were 18 years and above, and provided written informed consent in accordance with the declaration of Helsinki.

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Author Contributions

All authors contributed significantly to the work and have agreed on the journal to which the article will be submitted, gave final approval of the version to be published, and agreed to be accountable for all aspects of the work.

Disclosure

The authors report no conflicts of interest in this work.

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