Innovations

Evaluation of Audiences' Knowledge, Attitude and Response towards Social Media Messages on the Covid-19 Vaccine among Social Media Users in South-east, Nigeria

Abonyi, Solomon Emeka, Odenigbo Cynthia Ifeoma & Professor. Nnanyelugo Okoro

Department of Mass Communication, University of Nigeria, Nsukka

*Corresponding Author: **Odenigbo, Cynthia Ifeoma**

Abstract

Social media emerged as a platform characterized by vigorous discussions about COVID-19 vaccines, accompanied by a noticeable surge in comments that discourage COVID-19 vaccination. This phenomenon highlights the intricate nature of social media's impact. Hence, the research aimed to evaluate audiences' knowledge, attitudes, and responses towards social media messages on the COVID-19 vaccine among social media users in South-east Nigeria. Specifically, the study explored social media users' level of awareness, knowledge, attitude and response towards social media messages on the COVID-19 vaccine. The survey research design was adopted for the research. The population of the study is 14,684,504, which is the population of internet users in South-east Nigeria. A sample size of 384 was obtained using the formula provided by Aroaye (2004). Three hundred and eight four copies of the online questionnaire created using Google form were used to gather the opinions of social media users in South-east, Nigeria on the topic. The findings revealed that all respondents were aware of the COVID-19 vaccine, with Facebook being the preferred platform for vaccine updates. However, the majority of respondents agreed that social media messages on the COVID-19 vaccine promoted hesitancy towards the vaccine. Based on the findings, the researchers recommended that public health authorities and organizations, such as WHO, CDC, and NCDC, among others, adopt tailored messaging strategies that address misconceptions, enhance vaccine knowledge, and emphasize the safety and efficacy of the vaccine.

Introduction

As the world was waiting for the vaccine, its formulation and trial commenced on the 17th of March 2020 with the Moderna mRNA vaccine (WHO, 2020); a stricter restriction beyond social distancing and the use of face marks were needed as people were still dying in numbers, from North America to Europe, Asia, South America, Australia, and Africa. Hence, all local and international borders began to close with compulsory stay-at-home implementation in many countries (Odezulu, Odenigbo &Anyakoha, 2023).

Months later, a relief came, as the Pfizer and BioNTech vaccines proved to be 90% effective on the 9th of November. By the 16th of November, the Moderna Vaccine was also shown to be effective, likewise, the University of Oxford and AstraZeneca COVID-19 which got confirmed on the 23rd of November 2020. WHO,

on 31st of December 2020, issued the first emergency use for a COVID-19 vaccine, making the Pfizer/BioNTech vaccine the first available for use. The emergency validation was seen as a positive step towards ending the pandemic (WHO, 2020; Moore, 2021).

Mass vaccination has proven to be the most efficient strategy for controlling widespread infectious disease outbreaks and has been embraced and put into action by numerous nations(Hajj-Hussein et al., 2015; Fisher, 2020). However, in Sub-Saharan Africa, the COVID-19 vaccine was met with hesitancy due to controversial information available to the public, mainly from social media. Some concerns raised were safety, mistrust from the vaccine companies, poor vaccine promotion and conflicting information. Ackak et al. (2022) note that vaccine hesitancy remains a significant challenge, even within groups that typically do not display strong resistance to accepting vaccines or other healthcare measures

Since the Centers for Disease Control and Prevention (CDC) authenticates the safety of COVID-19 for all within 5 years of age and above. What could be the reason behind Nigeria and several African countries rejecting the vaccine? The reason is simply propaganda, and whichever means this was promulgated, communication has occurred, and the power of communication dates back centuries (Odezulu, Odenigbo &Anyakoha, 2023).

Social media emerged as a platform marked by intense debates about COVID-19 vaccines, with a notable influx of comments discouraging COVID-19 vaccination occurring even before their official rollout (Griffith, Marani&Monkman, 2021; Wawrzuta, Jaworski, Gotlib&Panczyk, 2021). This negative sentiment and attitude on social media continued even after the commencement of the vaccination campaign (Huangfu, Mo, Zhang &Zeng, 2022; Karami, Zhu, Goldschmidt, Boyajieff&Najafabadi, 2021).

Vaccine acceptability is usually based on the level of awareness created and the resources available to the public. The rapid spread of both accurate information and misinformation through social media channels has a direct impact on public understanding, attitudes, and behaviours, particularly in the context of COVID-19 vaccines. This study aims to comprehensively explore and evaluate the dynamics of audience knowledge, attitude and response to social media messages related to the COVID-19 vaccine. Specifically, the study seeks to:

- Ascertain the level of awareness about the COVID-19 vaccine among social media users in South-east Nigeria.
- Determine the audience's knowledge about social media messages on the COVID-19 vaccine.
- Determine how these social media messages on the COVID-19 vaccine influence the attitude of social media users in South-east Nigeria.
- Evaluate their response to social media messages on the COVID-19 vaccine.

The study was guided by the following hypotheses:
- Hypothesis 1: There is no significant relationship between the level of knowledge about the COVID-19 vaccine among social media users in South-east Nigeria and their attitudes towards receiving the COVID-19 vaccination.
- Hypothesis 2: There is no significant relationship between social media users' knowledge of the COVID-19 vaccine and their response to the COVID-19 vaccination.

Empirical Review

On COVID-19 vaccine awareness, Reuben, Danladi, Saleh, and Ejembi (2020) unveil that an overwhelming majority, precisely (99.5%, 586) of the respondents, exhibited awareness regarding the COVID-19 vaccine. Similarly, Odezulu, Odenigbo and Anyakoha (2023) indicate that all the respondents (360, 100%) were aware

of the COVID-19 vaccine, with the majority (147, 40.8%) of the respondents indicating they prefer social media as a means of information dissemination.

Additionally, Imediegwu et al. (2023) aver that all participating respondents unequivocally confirmed their awareness of COVID-19 vaccines. Furthermore, Usman, Msughter and Ridwanullah (2023) reveal that a substantial (92%) of the respondents are indeed aware of the existence of the COVID-19 vaccine.

On means of accessing COVID-19 vaccine information, Orok, Ndem, and Daniel (2022) state that the majority of the respondents source information about the COVID-19 pandemic and vaccines from social media (140, 60%). In addition, Reuben, Danladi, Saleh, and Ejembi (2020) discovered that the majority of participants, accounting for (55.7%, 328), identified the internet and social media as their primary avenue of awareness and knowledge about the COVID-19 vaccine. Osuagwu et al. (2023) also add that the observed respondents relied on social media platforms (73%) for COVID-19 vaccine information.

On COVID-19 vaccine knowledge, Abebe, Shitu, and Mose (2021) discovered that nearly three-quarters of the participants, exactly 364 individuals (74.0%), exhibited a commendably comprehensive understanding of the COVID-19 vaccine. Bademosi et al. (2022) opine that the study observed that a substantial 75.1% of the students possessed a commendable level of knowledge regarding the COVID-19 vaccine.

In addition, Mohamed et al. (2021) affirm that 75% of the respondents disagreed with the notion that the COVID-19 vaccine could trigger an infection. Hence, the vaccine is safe. Comparably, Rahman et al. (2022) opine that around 54.34% of the students concurred that the COVID-19 vaccine is both safe and effective, and about 43.88% held the belief that the vaccine has the potential to halt the pandemic.

Furthermore, Imediegwu et al. (2023) opine that the acceptance rate derived from their study stands at 56.3%. Hence, the vaccine is greatly accepted. Similarly, Abebe, Shitu, and Mose (2021) state that a substantial number of 308 respondents (62.6%) indicated their willingness to embrace the COVID-19 vaccine. Additionally, Orok, Ndem, and Daniel (2022) indicate that 96 respondents (41.2%) expressed a willingness to receive the vaccines.

On Vaccine hesitancy, Abebe, Shitu, and Mose (2021) aver that 184 respondents (37.4%) exhibited hesitation towards accepting any COVID-19 vaccine. Notably, Orok, Ndem, and Daniel (2022) indicate that a significant 36.11% of respondents cited their lack of trust in the vaccine's safety and efficacy as the primary reason for their refusal to accept the vaccines.Furthermore, Ijioma and Nze (2022) state that 120 of 204 respondents indicated encountering messages cautioning them against COVID-19 vaccine uptake on their social media platforms.

Comparably, Rahman et al. (2022) opine that 26.06% exhibited vaccine hesitancy among the respondents, with fear of side effects (87.18%) and lack of information (70.94%) being the primary reasons for their hesitancy. Similarly, Osuagwu et al. (2023) aver that social media users exhibited the highest rate of COVID-19 resistance (87%).

On audiences' attitude towards vaccine safety, Anorue et al. (2021) state that a greater percentage of the respondents (42.4%) express doubt regarding the safety of the COVID-19 vaccine messages. Similarly, Anorue et al. (2021) add that (52.9%) of respondents accept being aware of the potential side effects associated with the COVID-19 vaccine.

Furthermore, the study results of Ijioma and Nze (2022) agree with this study as they affirm that out of the 204 respondents sampled, 120 indicate encountering social media messages cautioning against COVID-

19 vaccine uptake on their social media platforms.Rahman et al. (2022) state that overall, 64.81% of the university students' demonstrated positive levels of attitude towards the COVID-19 vaccine.

On the response towards the COVID-19 vaccine, Orok, Ndem, and Daniel (2022) opine that the majority of participants (119, 51.1%) held a positive view regarding the COVID-19 vaccines. Additionally, Sadiq, Croucher, and Dutta (2023) reveal that (53.5%) of the videos exhibited a positive tone towards the COVID-19 vaccine.

Health Belief Model

This study was anchored on the Health Belief Model.
The Health Belief Model has evolved to address public health issues and has been applied to numerous people and health behaviours (Glanz, Rimer&Viswanath, 2008). HBM is one of the most widely applied theories of health behaviour (Glanz& Bishop, 2010). The health belief model (HBM) posits that six constructs predict health behaviour: risk susceptibility, risk severity, benefit to action, barriers to action, self-efficacy, and cues to action (Champion & Skinner, 2008; Rosenstock, 1994 in Jones et al., 2015).

The theory has been widely used and has provided an appropriate framework for investigating health behaviour and identifying principal health beliefs. The key strength of the HBM lies in the fact that it was developed by researchers directly working with health behaviour (Conner & Norman, 2021).

According to the HBM, a person's belief in a personal risk of disease, as well as their conviction in the effectiveness of the suggested health activity or action, can predict whether they would engage in the practice (LaMorte, 2019).

Scientists utilise the Health Belief Model (HBM) to predict health behaviours. It was first created in the 1950s and was then upgraded in the 1980s. The approach is founded on the idea that a person's desire to modify their health practices is largely determined by their views of their health (Boskey, 2020). The Health Belief Model (HBM) posits that messages will achieve optimal behaviour change if they successfully target perceived barriers, benefits, self-efficacy, and threats (Jones et al., 2015).

HBM is suitable for this study because the theory holds that a person's decision to adopt healthy behaviour is dependent on their perceptions. When the COVID-19 vaccine is treated with paltriness, the public will disregard messages about this health predicament and the need to get vaccinated because they do not feel threatened by the menace or safe taking the vaccine because of the conspiracy theories on social media which will drastically reduce the vaccine acceptance and brew vaccine hesitancy. Therefore, altering controversial messages on social media through effective communication campaigns, a persistent emphasis and intentional dissemination of accurate information on the COVID-19 vaccine using social media platforms of health agencies such as the World Health Organization, Centers for Disease Control and Prevention, Nigeria Centre for Disease Control, etc. These strategies will result in the adoption of new behaviours that promote healthy living and vaccine acceptance.

Research Methodology

The survey research method was employed to collect the requisite quantitative data for the study.   In social science research, the online survey is thriving and has successfully been deployed for several recent studies. Since the audience of the study involves social media users, the most appropriate survey to adopt would be the online survey method.

Due to a substantial global population now being digitally interconnected, there is a transition from traditional paper-pencil surveys to utilizing online surveys in research. Internet-based technologies are increasingly recognized as practical and efficient means of gathering data, even on sensitive subjects (Bhattacherjee, 2012; Regmi, Waithaka, Paudyal, Simkhada&Teijlingen, 2016).

The population of the study consists of adult internet users in South-east Nigeria. The population of adult internet users, according to the National Bureau of Statistics (2021), is 14,684,504. A sample size of 384 was drawn from the total research population of 14,684,504 using the formula provided by Aroaye (2004)

Using a random sampling technique, the South-east geopolitical zone of Nigeria was selected from Nigeria to serve as the study area. South-east is made up of five states and every adult internet user within these areas was considered. Online copies of the questionnaire created using Google form were distributed to eight WhatsApp groups purposively selected based on the calibre of the individuals on these groups and the enriching opinions that would be elicited from these users.

WhatsApp was chosen for this study because it has been proven by other researchers to be a credible platform for eliciting the responses of internet users (De Gruchy, Vearey, Opiti, Mlotshwa, Manji&Hanefeld, 2021; Manji, Hanefeld, Vearey, Walls & De Gruchy, 2021).

Results

Table 1: Analyses of the Audiences' Awareness of COVID-19 Vaccine among Social Media Users in South-east Nigeria

	Items	n (%)	n (%)	n (%)	n (%)	n (%)
6.	I am aware of COVID-19 vaccine	**Yes**	**No**			
		384(100)	0(0)			
7.	I got my first awareness of the COVID-19 vaccine through	**Social Media**	**Family/ Friends**	**Health Care Workers**	**Newspaper/ Magazine**	**Radio/Tv**
		209 (54)	47 (12)	12 (3)	26 (7)	90 (23)
8.	My preferred social media platform for COVID-19 vaccine update	**Facebook**	**Instagram**	**Twitter**	**TikTok**	**WhatsApp**
		143 (37)	92 (24)	56 (14)	14 (4)	79 (21)
9.	I read messages on the COVID-19 vaccine on social media during the peak of the vaccination	**Daily**	**Weekly**	**Biweekly**	**Monthly**	**Rarely**
		182 (47)	97 (25)	73 (19)	32 (8)	0(0)

The result shows that all the respondents, 384 (100%), are aware of the COVID-19 vaccine. Similarly, most of the respondents 209 (54%), selected social media as the first means of awareness of the COVID-19 vaccine, and Facebook 143 (37%) as their preferred social media platform for COVID-19 vaccine updates.Additionally, most respondents, 182 (47%), accepted they read messages on the COVID-19 vaccine daily on their preferred social media platform during the peak of the vaccination.

Table 2: Analyses of the Audience's knowledge towards Social Media Messages on the COVID-19 Vaccine in terms of the Mean and Standard Deviation of the Research Item

S/N	Audiences' Knowledge	SA	A	D	SD	$\overline{x} \pm std$	Decision
	Item Statement	**n(%)**	**n(%)**	**n(%)**	**n(%)**	Positive ≥ 2.5	Negative ≤ 2.5
10.	Social media messages on the COVID-19 vaccine indicate the vaccine is safe and effective	68 (18)	190 (49)	31 (8)	95 (25)	2.60±2.29	Positive
11.	Social media messages on the COVID-19 vaccine provided comprehensive knowledge about the vaccine	147 (38)	79 (21)	114 (30)	44 (11)	2.85±2.53	Positive
12.	Social media messages on the COVID-19 promoted vaccine acceptance	79 (21)	96 (25)	69 (18)	140 (36)	2.29±2.08	Negative
13.	Social media messages on the COVID-19 promoted vaccine hesitancy	141 (37)	106 (27)	49 (13)	88 (23)	2.78±2.51	Positive
	Batch Mean	**2.63**					

The findings show that the majority of the respondents, 190 (49%), agree that social media messages on the COVID-19 vaccine are safe and effective. Similarly, the majority of the respondents, 147 (38%), strongly agree that social media messages on the COVID-19 vaccine provided comprehensive knowledge about the vaccine. Furthermore, the majority of the respondents, 140 (36%), strongly disagree that social media messages on COVID-19 promoted vaccine acceptance. Additionally, most of the respondents, 141 (37%), strongly agree that social media messages on COVID-19 promoted vaccine hesitancy.

Table 3: Analyses of the Audience's Attitude to Social Media Messages on the COVID-19 Vaccine in terms of the Mean and Standard Deviation of the Research Item

S/N	Audiences' Attitude	SA	A	D	SD	$\overline{x} \pm std$	Decision
	Item Statement	**n(%)**	**n(%)**	**n(%)**	**n(%)**	Positive ≥ 2.5	Negative ≤ 2.5
14.	I think social media messages on the COVID-19 vaccine made me change my negative attitude and accept that the vaccine is safe and effective	105 (27)	82(22)	124 (32)	73 (19)	2.57±2.28	Positive
15.	I think social media messages on the COVID-19 vaccine prompted me to be vaccinated	102 (24)	86 (22)	110 (29)	86 (25)	2.53±2.25	Positive

16.	I think social media messages on the COVID-19 vaccine made me understand that the side effects are normal	121 (31)	130 (34)	45 (12)	88 (23)	2.73±2.45	Positive
17.	I think social media messages on the COVID-19 vaccine made me reject the COVID-19 vaccine	95 (25)	51 (13)	198 (52)	40 (10)	2.52±2.19	Positive
	Batch Mean	**2.58**					

Findings from research question three indicate that most of the respondents, 124 (32%), disagree that social media messages on the COVID-19 vaccine made them change their negative attitude and accept that the vaccine is safe and effective. Additionally, most respondents, 110 (29%), disagree that social media messages on the COVID-19 vaccine prompted them to receive the vaccination. Similarly, the majority of the respondents, 130 (34%), agree that social media messages on the COVID-19 vaccine made them understand that the side effects are normal. Finally, most of the respondents, 198 (52%), disagree that social media messages on the COVID-19 vaccine made them reject the COVID-19 vaccine.

Table 4: Analyses of the Audience's Response to Social Media Messages on the COVID-19 Vaccine in terms of the Mean and Standard Deviation of the Research Item

S/N	Audiences' Response	SA	A	D	SD	$\bar{x} \pm std$	Decision
	Item Statement	n(%)	n(%)	n(%)	n(%)	Positive ≥ 2.5	Negative ≤ 2.5
18.	I did not receive the COVID-19 vaccine until today because of the controversial messages on social media	103 (22)	87 (17)	129 (39)	65 (22)	2.59±2.29	Positive
19.	The controversies surrounding the COVID-19 vaccine created panic and increased hesitancy in response	181 (47)	94 (24)	57 (15)	52 (14)	3.05±2.71	Positive
20.	The controversies surrounding the COVID-19 vaccine created no panic and led to a high acceptance response	52 (14)	37 (10)	104 (27)	191 (49)	1.86±1.65	Negative
21.	The general response towards social media messages on COVID-19 vaccine was negative	98 (25)	81 (21)	156 (41)	49 (13)	2.59±2.26	Positive
	Batch Mean	**2.52**					

The result from research question four shows that the majority of the respondents, 129 (39%), disagree that they have not received the COVID-19 vaccine to date because of the controversial messages on social media. Additionally, most of the respondents, 181 (47%), strongly agree that the controversies surrounding the COVID-19 vaccine created panic and increased hesitancy in response. Similarly, most of the respondents, 191 (49%), strongly disagree that the controversies surrounding the COVID-19 vaccine created no panic and led

to a high acceptance response. Moreover, most of the respondents, 156 (41%), disagree that the general response towards social media messages on the COVID-19 vaccine was negative.

Test of Hypotheses

To test the formulated hypotheses in this study, the Regression analysis was employed. The hypotheses were examined with a significance level set at 0.05.

Hypothesis 1

The Null Hypothesis (HO1): There is no significant relationship between the level of knowledge about the COVID-19 vaccine among social media users in South-east Nigeria and their attitudes towards receiving the COVID-19 vaccination.

The Alternate Hypothesis (HA1): There is a significant relationship between the level of knowledge about the COVID-19 vaccine among social media users in South-east Nigeria and their attitudes towards receiving the COVID-19 vaccination.

Table 5: A Regression result of the social media users' knowledge level tested for relationship against their attitude

	Df	SS	MS	F	Significance F
Regression	1	2149.949393	2149.949393	7.165289256	0.227607353
Residual	1	300.0506073	300.0506073		
Total	2	2450			

The analysis involves a regression model with 1 degree of freedom for the regression and 1 degree of freedom for the residual (error) model, resulting in a total of 2 degrees of freedom.

From the above table, the p-value (0.22) is greater than 0.05, which is the level of significance set for the test. Hence, the null hypothesis is accepted.

Hypothesis 2

The Null Hypothesis (HO1): There is no significant relationship between social media users' knowledge of the COVID-19 vaccine and their responses to COVID-19 vaccination.

The Alternate Hypothesis (HA1): There is a significant relationship between social media users' knowledge of the COVID-19 vaccine and their responses to COVID-19 vaccination.

Table 6: A Regression result of the social media users' knowledge of COVID-19 tested for relationship against their response to COVID-19 vaccination

	Df	SS	MS	F	Significance F
Regression	1	12.13015	12.13015	0.00252	0.96807
Residual	1	4813.87	4813.87		
Total	2	4826			

The analysis involves a regression model with 1 degree of freedom for the regression and 1 degree of freedom for the residual (error) model, resulting in a total of 2 degrees of freedom.

From the above table, the p-value (0.96) is greater than 0.05, which is the level of significance set for the test. Hence, the null hypothesis is accepted.

Discussion of Findings
The result shows that all the respondents are aware of the COVID-19 vaccine. Similarly, most of the respondents selected social media as the first means of awareness of the COVID-19 vaccine, and Facebook as their preferred social media platform for COVID-19 vaccine updates. Additionally, most respondents accepted they read messages on the COVID-19 vaccine daily on their preferred social media platform during the peak of the vaccination.

The findings of the following authors concur with the results from this study as Reuben, Danladi, Saleh, and Ejembi (2020) unveil that an overwhelming majority, precisely (99.5%, 586) of the respondents, exhibited awareness regarding the COVID-19 vaccine. Similarly, Odezulu, Odenigbo and Anyakoha (2023) indicate that all the respondents (360, 100%) were aware of the COVID-19 vaccine. Furthermore, Imediegwu et al. (2023) aver that all participating respondents unequivocally confirmed their awareness of COVID-19 vaccines. Additionally, Usman, Msughter and Ridwanullah (2023) reveal that a substantial (92%) of the respondents are indeed aware of the existence of the COVID-19 vaccine.

Comparably, on means of accessing COVID-19 vaccine information, Orok, Ndem, and Daniel (2022) state that the majority of the respondents source information about the COVID-19 pandemic and vaccines from social media (140, 60%). In addition, Reuben, Danladi, Saleh, and Ejembi (2020) discovered that the majority of participants, accounting for (55.7%, 328), identified the internet and social media as their primary avenue of awareness and knowledge about the COVID-19 vaccine. Osuagwu et al. (2023) also add that the observed respondents relied on social media platforms (73%) for COVID-19 vaccine information.

The findings from research question two show that the majority of the respondents agree that social media messages on the COVID-19 vaccine are safe and effective. Similarly, the majority of the respondents strongly agree that social media messages on the COVID-19 vaccine provided comprehensive knowledge about the vaccine. Furthermore, the majority of the respondents strongly disagree that social media messages on COVID-19 promoted vaccine acceptance. Additionally, the majority of the respondents strongly agree that social media messages on COVID-19 promoted vaccine hesitancy. The following findings concur with the results of this as Odezulu, Odenigbo and Anyakoha (2023) affirm that the majority (147, 40.8%) of the respondents indicate they prefer social media as a means of information dissemination. Similarly, Abebe, Shitu, and Mose (2021) discovered that nearly three-quarters of the participants, exactly 364 individuals (74.0%), exhibited a commendably comprehensive understanding of the COVID-19 vaccine. In addition, Bademosi et al. (2022) opine that the study observed that a substantial 75.1% of the students possessed a commendable level of knowledge regarding the COVID-19 vaccine.

Furthermore, Mohamed et al. (2021) affirm that 75% of the respondents disagreed with the notion that the COVID-19 vaccine could trigger an infection. Hence, the vaccine is safe. Comparably, Rahman et al. (2022) opine that around 54.34% of the students concurred that the COVID-19 vaccine is both safe and effective, and about 43.88% held the belief that the vaccine has the potential to halt the pandemic.

Furthermore, Imediegwu et al. (2023) opine that the acceptance rate derived from their study stands at 56.3%. Hence, the vaccine is greatly accepted. Similarly, Abebe, Shitu, and Mose (2021) state that a substantial number of 308 respondents (62.6%) indicated their willingness to embrace the COVID-19 vaccine. Additionally, Orok, Ndem, and Daniel (2022) indicate that 96 respondents (41.2%) expressed a willingness to receive the vaccines.

Findings from research question three indicate that the majority of the respondents disagree that social media messages on the COVID-19 vaccine made them change their negative attitude and accept that the

vaccine is safe and effective. Additionally, most of the respondents disagree that social media messages on the COVID-19 vaccine prompted them to receive the vaccination. Similarly, the majority of the respondents agree that social media messages on the COVID-19 vaccine made them understand that the side effects are normal. Finally, the majority of the respondents disagree that social media messages on the COVID-19 vaccine made them reject the COVID-19 vaccine. The following findings are in arrangement with the result of this study as Abebe, Shitu, and Mose (2021) aver that 184 respondents (37.4%) exhibited hesitation towards accepting any COVID-19 vaccine. Notably, Orok, Ndem, and Daniel (2022) indicate that a significant 36.11% of respondents cited their lack of trust in the vaccine's safety and efficacy as the primary reason for their refusal to accept the vaccines. Furthermore, Ijioma and Nze (2022) state that 120 of 204 respondents indicated encountering messages cautioning them against the COVID-19 vaccine uptake on their social media platforms.

Comparably, Rahman et al. (2022) opine that 26.06% exhibited vaccine hesitancy among the respondents, with fear of side effects (87.18%) and lack of information (70.94%) being the primary reasons for their hesitancy. Similarly, Osuagwu et al. (2023) aver that social media users exhibited the highest rate of COVID-19 resistance (87%).

On audiences' attitude towards vaccine safety, Anorue et al. (2021) state that a greater percentage of the respondents (42.4%) express doubt regarding the safety of the COVID-19 vaccine messages. Similarly, Anorue et al. (2021) add that (52.9%) of respondents accept being aware of the potential side effects associated with the COVID-19 vaccine.

Furthermore, the study results of Ijioma and Nze (2022) agree with this study as they affirm that out of the 204 respondents sampled, 120 indicate encountering social media messages cautioning against COVID-19 vaccine uptake on their social media platforms. Rahman et al. (2022) state that overall, 64.81% of the university students' demonstrated positive levels of attitude towards the COVID-19 vaccine.

The result from research question four shows that the majority of the respondents disagree that they have not received the COVID-19 vaccine to date because of the controversial messages on social media. Additionally, most of the respondents strongly agree that the controversies surrounding the COVID-19 vaccine created panic and increased hesitancy in response. Similarly, most of the respondents strongly disagree that the controversies surrounding the COVID-19 vaccine created no panic and led to a high acceptance response. Moreover, most of the respondents disagree that the general response towards social media messages on the COVID-19 vaccine was negative. The following findings agree with the result of this study as Orok, Ndem, and Daniel (2022) opine that the majority of participants (119, 51.1%) held a positive view regarding the COVID-19 vaccines. Additionally, Sadiq, Croucher, and Dutta (2023) reveal that (53.5%) of the videos exhibited a positive tone towards the COVID-19 vaccine.

Conclusion

In conclusion, this study provides valuable insights into how social media messages influence people's perceptions and responses to the COVID-19 vaccine. Social media plays a pivotal role in spreading vaccine information, with most participants becoming aware of the vaccine through these platforms, particularly Facebook. The study found that these messages generally conveyed comprehensive vaccine knowledge and normalized expectations of side effects.

However, there were differing opinions on vaccine acceptance and hesitancy, highlighting the complex impact of social media. While respondents acknowledged panic and heightened hesitancy due to controversies, opinions varied on whether these controversies translated into greater vaccine acceptance. This duality highlights how social media discussions can polarize opinions, potentially amplifying concerns or dispelling misconceptions.

References

1. Abebe, H., Shitu, S., &Mose, A. (2021). *Understanding of COVID-19 Vaccine Knowledge, Attitude, Acceptance, and Determinates of COVID-19 Vaccine Acceptance Among Adult Population in Ethiopia. Infection and drug resistance, 14, 2015–2025.*

2. Ackah, B.B.B., Woo, M., Stallwood, L. Fazal, Z.A. &Okpani, A., Ukah, U.V. &Adu, P.A. (2022). *COVID-19 vaccine hesitancy in Africa: a scoping review. glob health res policy* **7** *(21).*

3. Anorue, L. I., Ugwu, A. C., Ugboaja, S. U., Nwabunze, U. O., Ugwulor-Onyinyechi, C. C., &Njoku, C. (2021). *Communicating COVID-19 Vaccine Safety: Knowledge and Attitude Among Residents of South East, Nigeria. Infection and drug resistance, 14, 3785–3794.*

4. Araoye, M.O. (2004) *Sample Size Determination. In Araoye, M.O. (ed.). Research Methodology with Statistics for Health and Social Sciences. Ilorin. NathadexPublishers. Nigeria.*

5. Bademosi , T. A., Sokolo , J. E., Austin-Asomeji , I., Pius , O. M., &Iyalla , C. N. (2022). *Knowledge, Atitude and Uptake of COVID-19 Vaccine among Undergradute Students in Southern Nigeria. Asian Journal of Medicine and Health, 20(12), 212–221.*

6. Bhattacherjee, A. (2012). *Social Science Research: Principles, Methods, and practices.Textbooks Collection. 3.*

7. Champion, V. L., & Skinner, C. S. (2008).*The health belief model. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), Health behavior and health education: Theory, research, and practice (pp. 45–65). Jossey-Bass.*

8. Conner, M. & Norman, P. (2017).*Health behaviour: Current issues and challenges.Psychology &Health . (32):8 (895-906).*

9. De Gruchy, T., Vearey, J., Opiti, C., Mlotshwa, L., Manji, K., &Hanefeld, J. (2021).*Research on the move: exploring WhatsApp as a tool for understanding the intersections between migration, mobility, health and gender in South Africa. Globalization and health, 17(1), 71.*

10. Fisher, K.A, Bloomstone, S.J., Walder, J., Crawford, S., Fouayzi, H., &Mazor, K.M. (2020).*Attitudes toward a potential SARS-CoV-2 vaccine: a survey of U.S. adults.Ann Intern Med. 173(12):964–73.*

11. Glanz, K., Rimer, B. K., &Viswanath, K. (2008). *Health behavior and health education: Theory, research, and practice. San Francisco, CA: Jossey-Bass.*

12. Glanz, K., & Bishop, D. B. (2010). *The role of behavioral science theory in development and implementation of public health interventions. Annual Review of Public Health, 31, 399– 418.10.1146/annurev.publhealth.012809.103604.*

13. Griffith, J., Marani, H., &Monkman, H. (2021).*COVID-19 Vaccine Hesitancy in Canada: Content Analysis of Tweets Using the Theoretical Domains Framework.Journal of Medical Internet Research, 23, e26874.*

14. Hajj Hussein, I., Chams, N., Chams, S., El Sayegh, S., Badran, R., Raad, M., Gerges-Geagea, A., Leone, A., &Jurjus, A. (2015). *Vaccines Through Centuries: Major   Cornerstones of Global Health. Frontiers in public health, 3, 269.*

15. Huangfu, L., Mo, Y., Zhang, P., Zeng, D. D., & He, S. (2022). *COVID-19 Vaccine Tweets after Vaccine Rollout: Sentiment–Based Topic Modeling. Journal of Medical Internet Research, 24, e31726.*

16. Ijioma, N. and Nze, C. (2022) *Evaluating the Influence of Social Media Use in COVID-19 Vaccine Hesitancy of Residents of Owerri Metropolis. Advances in Journalism and Communication, 10(24).*

17. Imediegwu, K.U., Abor, J.C., Onyebuchukwu, C.Q., Ugwu, H.I., Ugwu, O.I., Anyaehie, U.E. &Onyia, O.A. (2023).*Knowledge and acceptance of COVID-19 vaccine among healthcare workers in Enugu metropolis, Enugu State, Nigeria.Frontier in Public Health, 11 , 1084854.*

18. Jones, C.L., Jensen, J.D., Scherr, C.L., Brown,N.R., Christy, K. & Weaver, J. (2015). *The Health Belief Model as an Explanatory Framework in Communication Research: Exploring Parallel, Serial, and Moderated Mediation.Health Communication. 30(6): 566–576.*

19. Manji, K., Hanefeld, J., Vearey, J., Walls, H. &Gruchy, H. (2021). *Using WhatsApp messenger for health systems research: a scoping review of available literature, Health Policy and Planning, 36(5) 774–789,*

20. Mohamed, N.A, Solehan H.M, Mohd Rani, M.D, Ithnin, M., CheIsahak, C.I. (2021) Knowledge, acceptance and perception on COVID-19 vaccine among Malaysians: A web-based survey.PLoS ONE 16(8): e0256110.

21. National Bureau of Statistics (NBS). (2021). Telecoms Data: Active Voice and Internet per State, Porting and Tariff Information.

22. Odezulu, L.C., Odenigbo, C.I. &Anyakoha, B.U. (2023). Residents' Knowledge and Attitude towards Media Messages on COVID-19 Vaccine In Enugu Metropolis. International Research Journal of Modernization in Engineering Technology and Sciences.05(09), 377-380.

23. Orok E, Ndem E and Daniel E (2022) Knowledge, attitude and perception of medical students on COVID-19 vaccines: A study carried out in a Nigerian University. Frontier in Public Health 10:942283.

24. Osuagwu, U.L., Mashige, K.P., Ovenseri-Ogbomo, G. et al. (2023). The impact of information sources on COVID-19 vaccine hesitancy and resistance in sub-Saharan Africa. BMC Public Health 23 (38).

25. Rahman MM, Chisty MA, Alam MA, Sakib MS, Quader MA, Shobuj IA, Halim, MA &Rahman, F. (2022) Knowledge, attitude, and hesitancy towards COVID-19 vaccine among university students of Bangladesh. PLoS ONE 17(6): e0270684.

26. Regmi, P.R., Waithaka, E., Paudyal, A., Simkhada, P. & Van-Teijilingen, E. (2016). Guide to the design and application of online questionnaire surveys. Nepal Journal of epidemiology, 6(4), 640-644

27. Reuben, R.C., Danladi, M.M.A., Saleh, D.A. et al. Knowledge, Attitudes and Practices Towards COVID-19: An Epidemiological Survey in North-Central Nigeria. J Community Health 46, 457–470 (2021).

28. Sadiq, M., Croucher, S., &Dutta, D. (2023). COVID-19 Vaccine Hesitancy: A Content Analysis of Nigerian YouTube Videos. Vaccines, 11(6), 1057.

29. Usman, B., Msughter, A.E., &Ridwanullah, A.O. (2023).Social Media Use: Awareness of Covid-19 Vaccine and Acceptance among Undergraduate Students in Kano State, Nigeria.Research Square.

30. Wawrzuta, D., Jaworski, M., Gotlib, J., &Panczyk, M. (2021). What Arguments against COVID-19 Vaccines Run on Facebook in Poland: Content Analysis of Comments.Vaccines, 9, 481.