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Influence of social media on the acceptance of COVID-19 vaccine: A study of Nigerian Youths

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Abstract

Use of social media may have an impact on how people feel about the COVID-19 vaccine. Vaccinations are effective only when a consequential proportion of the population are vaccinated.

Objective: this study aims to examine the role of social media in the acceptance of the COVID 19 vaccines among Nigerian Youths.

Methods: an online survey was conducted in Nigeria, and 120 youths took part in the study. Logistic regression was adopted to discover the demographic and social media usage factors

Results: Of the 120 participants, 40% have been vaccinated, and 10.83% were reluctant to be vaccinated. This study revealed that social media factors were not significant enough to determine vaccine acceptance among the youths. Frequent social media users were 1.33 (OR = 1.33, 95% Cl = 0.44-3.30) times more likely to agree that the risk of COVID-19 vaccine was being exaggerated. However, participants with more trust in vaccine information shared online were less likely to agree that decision makers had ensured the safety of the vaccine.

Conclusion: the perception of the COVID-19 vaccine may change as a result of information published on social media. Therefore, it is crucial to share accurate and verified information about the COVID-19 vaccines on social media in order to boost public confidence and mitigate the effects of false propaganda.

Keywords: Vaccine; Youths; social media; Nigeria.

1. Introduction

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV2), which causes the coronavirus disease 2019 (COVID-19), is highly contagious and rapidly spreading illness [1]. The outbreak surfaced in Wuhan, China, in the late 2019 rapidly spread across countries. The World Health Organization (WHO) classified the outbreak as a pandemic [2]. In order to reduce the mortality brought on by the virus, antiviral medications and immunization have proven to be the most therapeutically effective and safe alternatives. A vaccine is a substance used to boost the immune system's defences against illness. In other to halt the pandemic, much effort was put into developing COVID- 19 vaccines. The S-protein of SARS-COV-2 has been used in the bulk of newly developed vaccines [3]. Continuous immunization, as well as its inventiveness in preparation and administration, are crucial for COVID-19 immunization to be effective. Public acceptance of the COVID-19 vaccine is necessary to maintain herd immunity, prevent outbreaks of vaccine associated illnesses, and make sure people adopt novel vaccines without hesitation. Misinformation about COVID-19 and its

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associated vaccines persisted throughout the pandemic, especially on social media, which is filled with incorrect information about the safety of the vaccines [4]. Although social media is regarded as one of the most efficient tools for mass education, especially during the current epidemic, it is sometimes misused to spread inaccurate, contradictory, and incomplete information [5]. Nigeria is the most populous country in Africa with one of the largest populations of youth in the world, with a median age of 18.1 years [2022]. The Nigerian government considers the youths as vulnerable in the society because of the rapid pace of change they experience at this time in their lives [7]. Nigeria's youth right from time are noted to be change agents and drivers of societal transformation. Since the COVID-19 immunization program had begun in Nigeria, the youths have been actively expressing their ideas and opinions on social media. The spread of false information that finally results in vaccine reluctance has also been greatly fueled by social media. Studies have explored the acceptance rates and determinants of the COVID-19 vaccine. One of such studies to determine the impact of social media in the acceptance of covid-19 vaccine in Saudi Arabia found out that there was a high degree of awareness indicated among Aseer population regarding misleading information about COVID-19 vaccination via social media. The study by Othman et al., [8] which was a cross sectional study that was conducted from June 17 to June 19, 2021 among 504 participants of the general population in Saudi Arabia also found out that there was no significant independent relationship between social media usage and peoples willingness to receive a COVID-19 vaccination. The authors revealed that further studies to explore the association between social media use and vaccination decisions are required to generalize this observation to the Saudi population.

Ramy [9], analysed COVID-19 vaccine acceptance among social media users. Their study determined the opinions and attitudes towards COVID 19 vaccines through analysing reactions and comments on social media users to the COVID 19 posts released by health authorities. From here, the authors used a convenient sampling techniques to include the countries. The authors developed a selection strategy to include social media posts from the official pages of the health authorities.

Biswas et al., [10] in a study published in Human vaccines and Immunotherapeutic examined the influence of social media usage on public attitudes and behaviour towards COVID19 vaccines in the Arab world. The researchers revealed that the behaviour towards vaccines can depend on multiple factors and use of social media.

The study which used a sample of 317 participants completed the survey. 217 participants were from 18 Arab nationalities who met the study criteria. The respondents were surveyed online between 2 May 2021 and 25 June, 2021. The study was performed based on convenience sampling methodology. It was revealed that there was a notable correlation between social media usage and peoples attitude towards COVID-19 vaccines. The authors noted that the study did not find any significant correlation between social media usage and people vaccination decision.

Anti-vaccine organizations are particularly active on social media, disseminating erroneous information about the negative side effects or long-term consequences of COVID-19 vaccines. For instance, a common misconception that is expressed on social media is that the COVID-19 vaccination has not been well tested and can result in DNA mutation and birth problems [11]. Other theories claim that the entire pandemic is a bioweapon and a plot, and that a few vaccine trial participants have perished [12]. It is essential to communicate clear and accurate facts about the safety and effectiveness of vaccines.

Most of the youths in Nigeria are the major users of social media. Disinformation about the vaccines spread by the news media, religious fanatics, medical professionals, and celebrities may cause the youths to hesitate or refuse the vaccination. A study by Wilson et al., [13] found that online misinformation campaigns are linked to a significant decline in the mean vaccination coverage over time and the amount of unfavorable social media talk about vaccinations [13]. However, in the information age, where Nigerian youths have access to information and false information on the media, a number of facts and myths about the COVID-19 vaccine have been shared on social media and in traditional media, raising concerns among the youths about whether or not to receive the vaccine. This has led to uncertainty, anxiety, and hesitancy among the public. Researchers need to learn more about the factors that influence people's readiness or unwillingness to volunteer for immunizations, specifically against COVID-19. This could be achieved by evaluating the factors that indicate unfavorable attitudes about vaccination and identifying the groups that show resistance to receiving the COVID-19 vaccine. Thus, this study investigates the role of social media in the acceptance of the COVID 19 vaccines among Nigerian Youths.

The findings of this study will provide researchers with more knowledge on the effect of social media on the administration of COVID 19 vaccines in Nigeria. The findings will aid the government to understand the extent to which social media has influenced the acceptability of COVID-19 vaccine in Nigeria. It will also provide pertinent information for students and other researchers conducting related research.

2. Material and methods

2.1. Study design and data collection

This online survey was conducted from 12th August, 2022 to 12th September, 2022. The target respondents were Nigerian youth between the ages of 18-35 years who could read and understand English. The data were collected using Google forms platform via an online questionnaire. This study was performed based on a convenience sampling methodology. The survey was shared as a link through different social media platforms (Twitter, Facebook and Whatsapp). These social media platforms were chosen because they are mostly used among the Nigerian Youths. Participants were encouraged to share the link with friends and contacts. It is speculated that people might have shared the link with their circle and snowballing could have happened. The survey link was shared through online media and the researchers are not aware of people who received this link. Hence, the response rate was not calculated. Participants of this study were informed of the purpose of the study, and were free to take part or opt out as they wished. No personal information like name, email, or ID was collected. These social media platforms were chosen because they are mostly used by the Nigerian Youths. A pilot study was conducted to determine the average time required to complete the questionnaire. Incomplete answers and quickly completed responses were excluded from the study.

2.2. Instrument of Data Collection

A questionnaire was employed as the instrument of data collection. The questionnaire was developed based on literature review and Focused group discussion. A panel of experts confirmed the content validity of the questionnaire. Face validity was conducted in a pilot study that included 40 participants who assessed the questionnaire clarity, and no significant modifications were required.

2.3. Questionnaire development

The questionnaire covered four subject: demographic, social media, COVID-19 vaccine acceptance and attitudes towards COVID-19 vaccines. The demographics questions were standard questions that are commonly used in literature [14; 15]. The vaccine acceptance questions were obtained from Kasier Family Foundation (KFF) health tracking poll study [16] to evaluate the determinants of vaccine hesitancy. Vaccine specific questions and social media related questions were developed based on existing literature [14].

2.4. Demographic questions

This consisted of age, gender, nationality, country of residence, occupations, education, and type of living. There were options for the gender question: male, female, and prefer not to say. Participants were asked to choose their living areas, either urban or rural. They were also asked about their type of living, such as living with family, living alone, and prefer not to say. They were asked to select their occupation from the list, such as students, health professionals, educationalists, employed in other sectors, own businesses, and unemployed.

2.5. Social media questions

There were five questions related to social media that aimed to elicit how people use social media and search for health-related information online. Participants were asked about their frequency of social media usage, how often they search vaccine related information online and how much they trust vaccine related information if their contact on social media share it.

2.6. COVID-19 Vaccines Acceptance questions

There were two questions to measure COVID-19 vaccine intention. Firstly, participants were asked about their willingness to vaccinate when the vaccines are recommended by health professionals and made available for their age group, profession, and health condition. Respondents who took the COVID-19 vaccine were among the respondents who had various concerns about the COVID-19 vaccines.

2.7. Vaccine-specific questions

The responses to these questions were measured on a five-point Likert scale from fully disagree to fully agree. The questions will be about the perceived risk of COVID-19 infection, the efficacy of the COVID-19 vaccine, trust in the government and manufacturing of COVID-19 vaccines, and knowledge about the vaccine and willingness to accept the vaccine. The questions will also investigate public concerns about vaccine safety and side effects. In addition, there will be a free text box option to write views about the COVID-19 vaccines. These questions were compiled from recent studies [10; 14].

2.8. Validity and Reliability

To ensure the validity of the chosen research instrument, the researchers studied a few related works that employed the same research instrument. After critical study of the questionnaire, it was passed to an expert for vetting and modification of some aspect of the questionnaire before it was shared online.

Reliability was done by retesting the questionnaire. This involves administering of the same questionnaire to the same respondents after an interval of 5 days. The researchers administered 20 copies of questionnaire to respondents in each selected social media as a mode of pretest to answer the main questions. After 5 days, the researchers went for a retest and discovered 5 errors from the respondents. To calculate the reliability co-efficient, the researcher adopted the Guttmann scale formula which was developed by Louis Guttmann in 1944. The formula is:

1 – Total error/Total response

1-   5/20 = 1 – 0.25 = 0.75

Reliability coefficient of questionnaire = 75% (very high).

2.9. Data analysis

2.9.1. Data cleaning.

Data were preprocessed by eliminating missing values, removing duplicates, and excluding data that did not meet the criteria (e.g., responses completed in less than half of the mean completion time).

2.10. Statistical analysis

The frequency, mean, maximum, mode, and standard deviation will be measured to find the descriptive characteristics of the data. Independent variables will be considered from the seven questions related to age, gender, and five social media-related questions (e.g., frequency of social media usage and searching vaccines-related information online, etc.).

Dependent variables were considered from one computed variable COVID-19 vaccine intention vaccine-specific questions.

3. Results

3.1. Demographics characteristics

Table 1 shows the demographic characteristics of the participants. Of the 120 participants, 64.2% (n = 77) were female, 35.8% (n=43) were males and the median age of participants was 27 years. 57.5% (n = 69) of the participants lived with their family and 85.8% (n = 103) lived in urban areas. 7.5% (n = 37) of the participants were employed in different sectors (e.g., private job, NGO job, freelancing, etc), 14.2% (n = 17) were students, 30.8% where health professionals and 20.8% were self-employed. All participants were Nigerian and reside in Nigeria. 75.5% (n = 110) of the participants were frequent on social media, whereas 32.5% (n = 43) of the participants were frequent in searching for vaccine information online. 94.8% (n = 115) of the participants trusted the COVID-19 vaccine information shared online while 5.2% (n=5) does not trust COVID-19 information online. 66.7 % (n = 80) of the participants search for more information on the internet when they heard any negative comments about the vaccine on social media, 33.3% (n=40) ignore any negative comment about the vaccine.

Table 1 Demographic Characteristics of Respondents

Age in years	Frequency	Percentage
19-25	37	11.8
26-32	64	52.9
33-35	16	26.6
Gender		
Females	77	64.70

Males	43	35.83
I live with		
Family	69	57.5
Alone	42	35
Other people	7	5.83
Prefer not to say	2	1.67
Occupation		
Health professionals	37	30.83
Employed	25	20.83
Own business	17	14.20
Student	17	14.20
Educationalist	11	9.20
Other sectors	9	7.50
Unemployed	4	3.33
Nationality		
Nigerian	120	100
Non-Nigerian	Nil	-
Country of residence		
Nigeria	120	100
Others	Nil	-
Location		
Urban	103	85.83
Rural	17	14.20
Frequency of social media usage		
Frequent	110	75.5
Not frequent	10	24.5
Frequency of vaccine information search		
Frequent	38	32.5
Not frequent	82	67.5
Trust vaccine information shared online		
Trust	115	94.8
No trust	5	5.2
Hearing negative comments about vaccines from social media		
Active	80	66.7
Passive	40	33.3
Engage in vaccine discussion in social media		
Active	29	24.2
Passive	91	75.8

3.2. Descriptive statistics for vaccine acceptance

Table 2 shows the descriptive statistics of vaccine acceptance responses of the participants. Based on this result, 60.9% (n = 122) of the participants were vaccine-acceptant, and 39.1% (n = 90) of them were vaccine-hesitant. Although 60% of the respondents have not been vaccinated, 40% (n=48) of the respondents have been vaccinated. 21.7% (n = 26) of the participants responded that they were likely to get the vaccine but 33.2% (n = 37) of those respondents mentioned that they would get the vaccine only if it is mandatory for their work. Of the 99 participants, 64.9% (n = 122) were in the vaccine-acceptant group, 32.44% (n = 61) were in the vaccine-hesitant group.

3.3. Social media and COVID-19 vaccine acceptance

If a COVID-19 vaccine is officially recommended and made available for your age group, profession and health condition would you be (n= 120)

Table 2 Social media acceptance rates

Total (negative)	47
Very unlikely to get	13
Unlikely to get	10
Unsure	24
Total (positive)	73
Likely to get	26
Very Likely to get	47
Did you get the vaccine?	
Yes	48
No	72

Binary logistic regression was adopted to forecast social media use on the possibility that social media usage might affect vaccine acceptance (Table 3). These assumptions were examined before applying binary logistic regression. The result revealed that none of the social media usage factors are significant ($p < 0.05$) to predict the vaccine acceptance behavior of the participants.

Table 3 Social media effect on vaccine acceptance

Social media usage factors	OR	95% Cl
Frequency of social media usage Frequent Not frequent	 1.33 Ref	0.442-3.30
Frequency of vaccine information search Frequent Not frequent	 1.00 Ref	0.440-2.22
Trust vaccine info shared Trust No trust	 1.22 Ref	0.539-2.35
Negative comments about vaccines Active Passive	 0.51 Ref	0.550-1.30
Engage in vaccine discussion online Active Passive	 0.73 Ref	0.38-1.48

3.4. Attitudes toward COVID-19 vaccines

Table 4 shows the characteristics of the participant's attitudes toward the COVID-19 vaccines. Of the 120 participants, 19.2% (n = 23) were willing to wait to see the effectiveness of the vaccines, while 48% (n =58) were worried about the side effects of vaccines. However, 4.2% (n = 5) of the participants were of the opinion that they would be affected by COVID-19 during vaccination, and 6.7% (n = 8) of them believed that the COVID-19 vaccines would increase the allergy. 30.8% (n = 37) of the participants believed that politics played a role in vaccine development. 16.7% (n = 20) of the participants believed that the decision-maker ensured the safety of the vaccine. 47% (n = 102) of the participants assumed that the risk of COVID-19 was being exaggerated. 10% (n = 12) of the participants reported that the vaccine development is too fast, and they wanted to wait to see if it works for others.

Table 4 Patient's attitudes towards vaccine

Attitudes	Disagree/Fully disagree	Agree/Fully agree	Neutral	No response
The vaccine is still new. I want to wait and see how it works for people	97 (80.8%)	23 (19.2%)	0	0
I am worried about the possible side effects	62 (52%)	58 (48%).	-	-
I am worried that I may get COVID-19 from the vaccine.	115 (95.8%)	5 (4.2%)		
I have serious allergic problems and the vaccine may increase it.	112 (93.3%)	8 (6.7%)		
I think politics has played too much of a role in the vaccine development process	83 (69.2%)	37 (30.8%)	-	-
I do not trust the decision makers made sure the vaccine is safe and effective	100 (83.3%)	20 (16.7%)		
I think the risk of the infection is exaggerated	97 (80.8)	23 (19.2%)		
I do not think I am at risk of getting infection from the disease	107 (89.2%)	13 (10.8%)		
I do not trust vaccines in general	113 (94.2%)	7 (5.8%)		
The vaccine development is too fast. I want to wait till it matures	108 (90%)	12 (10%)		

3.5. Social media usage and the Youths' attitudes toward COVID-19 vaccines

Table 5 shows the results obtained from a binary logistic regression that aims to predict the effect of social media usage factors on public attitudes in the COVID-19 vaccine. The table shows only the significant ($p < 0.05$) factors.

Table 5 Results obtained from a binary logistic regression

Variables	OR	95%Cl
Concerned about the side effect Trust vaccine information shared online A little A lot	 Ref 0.241	 0.113-1.213
The vaccine may increase allergy Trust vaccine information shared by contacts		

A little A lot	Ref 0.299	0.164-0.331
I don't trust that decision makers made sure the vaccine is safe Trust vaccine shared by contacts A little A lot	Ref 0.446	0.387-1.434
Risk of COVID-19 are being exaggerated Frequency of social media usage Not frequent Frequent	Ref 2.483	0.756-7.653
I don't think at risk of getting an infection from COVID-19 Engage with social media discussion Passive Active	Ref 2.453	0.5431-5.642
I don't trust the vaccine Trust vaccine info shared by contacts A little A lot	Ref 0.231	0.224-0.453
Vaccine development is too fast and wants to wait and see its efficacy Hearing negative comments about vaccines from social media Passive Active	Ref 2.103	0.486-2.391

Risk of COVID-19 exaggeration varies with the frequency of social media usage. Participants who were frequent in social media are 2.483 times more likely to agree that the risk of COVID-19 is being exaggerated than those who are not frequent in social media.

3.6. Trust in vaccine information shared online

Participants who have more trust in vaccine information shared by their contacts are less likely to agree that decision-makers have verified that vaccines are safe (OR = 0.241, 95% CI = 0.224–0.453, p<0.05). Participants who have more trust in the vaccine-related information shared by online are likely to be worried about the side effects of vaccines (OR = 0.241, 95% CI = 0.113-1.213), are more likely to agree that vaccines may increase allergic problems (OR = 0.299, 95% CI = 0.164-0.331).

3.7. Participating in online discussion

Online engagements on vaccine-related topics may influence Nigerian Youth attitude toward the perceived risk of COVID-19. Active participants in social media vaccine discussions are 2.50 times more likely to agree that they may not

get COVID-19 compared to those who are not active in social media vaccine discussions (OR = 2.453, 95% CI = 0.5431-5.642).

4. Discussion

This study demonstrated that social media social media usage can impact the behavior of Nigerian youths towards the COVID-19 vaccine. There are varied perspective towards the vaccine among Nigerian youths. Vaccine hesitancy is crucial to study in order to curtail the spread of the virus. Similar to our study from Biswas et al (2022) was conducted to determine the influence of social media usage on public attitudes and behavior toward COVID-19 vaccine in the Arab world. Our study is similar in terms of questions but differ in terms of population studied and the demography. Both studies revealed that social media has an impact on COVID-19 vaccine acceptance. Our study revealed that majority of the participants were confident about the vaccine acceptance. However, 60% (n=72) of the participants were yet to be vaccinated. Vaccine acceptance behavior is associated with safety, perceived risk, efficacy, positive and negative side effect of the vaccine (Md.Abdul et al, 2022) and are found to be dynamic according to demographic factors (Biswas et al 2022). Participants responded that the vaccine were new, majority responded that they were worried about the possible side effects of the vaccine. This result is in line with the findings of Biswas et Al 2022) where majority of the respondents showed concern towards the possible side effect of the vaccine. Male participants were more willing to get the vaccine than the female respondents. These findings were in consonance with the findings of Majid, [17]. The result revealed that greater percentage of the youth that participated were not yet vaccinated. Participants who trust vaccine info shared on social media are more concerned about the side effects. The possibility could be as a result of them being exposed to false materials shared in social media, where information are being spread the vaccine [18]. Female participants are more active on social media than the males but the males are most likely to take the vaccine.

Limitations

The number of participants did not reflect the actual number of youths in Nigeria, thus results may not be generalized for high confidence level. The sample of participants was mostly biased with urban subjects. The questionnaire was distributed online so youths that are financially challenged may not have data to subscribe for internet or skeptical about clicking the link in order to save data.

5. Conclusion

Vaccination is essential to reduce the transmission of the coronavirus. The effort to achieve high vaccination coverage, however, is hampered by a number of issues, including vaccine reluctance. This study surveyed Nigerian youths to discover the impact of social media usage on people's vaccination decisions and attitudes toward COVID-19 vaccines. The study revealed that there is a significant association between social media usage and youth's vaccination decision, there is a remarkable link between social media usage and people's attitude toward COVID-19 vaccines. People's decisions on health related matters are significantly influenced by social media as a source of public opinion and discussion, particularly during the COVID-19 epidemic when access to physical resources is constrained and dependence on online information is high. Exposure to COVID-19 vaccine-related misinformation on social media may shape the behavior of the public toward the vaccine. By fostering vaccine literacy, public awareness campaigns and other online initiatives can interrupt the cycle of misinformation on social media. However, health-related news should be carefully framed to effectively communicate the truth about vaccines. Even though the outcome of this study will be closer to Nigerian youths, the findings may be relevant to the general population of Nigeria.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare no conflict of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study and participants were free to leave the study at any time, with no consequences.

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