Assessment of Twitter campaigns of the Nigeria Center for Disease Control (NCDC) on Covid-19 pandemic

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Abstract

The emergence of Twitter and its usage for health information afforded the Nigerian people the opportunity of exploring different roles of social media, specifically, Twitter for health communication campaigns by the Nigeria Center for Disease Control (NCDC) during the pandemic. However, dearth of empirical studies on Twitter usage for Covid-19 Campaigns during the pandemic, and the fact that much of the available studies on the use of Twitter for health communication failed to provide an in-depth assessment of NCDC activities on Twitter, thereby creating a gap for further study. In view of this, this study assessed the use of Twitter by NCDC during the Covid-19 pandemic. The study adopted exploratory research design due to its conformity with qualitative research which was used to textually analyze 96 sample tweets made by NCDC on Twitter, between February 1st 2020 and January 31st 2021. Findings showed that NCDC primarily used Twitter for health communication as part of its job. Further findings showed that the tweets of the NCDC during the period of study not only revolved around COVID-19 casualties, sensitization and precautionary measures but also involved information management. Also, it was discovered that #TakeResponsibility, #Covid-19 and #Covid-19 Nigeria were the popular hashtags used by NCDC on Twitter. On the level of engagement, it was found that NCDC exhibited high level of engagement; even though they did not really interact deeply with Twitter users during the pandemic. Thus, the study concluded that with over 1.3 million Twitter users, and using "#TakeResponsibility, #Covid-19 and #Covid-19", the NCDC took advantage of Twitter to enhance its health communication by engaging in informative and participatory health communication. It was however recommended that NCDC should ensure adequate interactivity and dialogue with Twitter users to enhance high level of engagement, while other social media platforms should be explored to complement Twitter in subsequent health campaigns. Moreover, in-depth examination through the use of other research methods should be explored, to examine level of Twitter use by NCDC during COVID-19 pandemic.

Keywords: Campaigns, COVID-19 pandemic, NCDC, Twitter, Health Communication

Introduction

The unprecedented effect of the COVID-19 pandemic, which led to the total lockdown of economic and social activities around the world, has further advanced the importance and usage of social media platforms in the public health enlightenment campaign (Gulsoyet al., 2022). As the disease ranges on, users' engagement, such as reactions, sharing information, and content consumption related to the COVID-19 topic, rose to a high point on mainstream platforms such as Twitter, YouTube, and Instagram (Cinelli, Quattrociocchi and Galeazzi, 2020). The World Health Organisation (WHO) and other stakeholders also warned that a well-informed citizenry is one of the best strategies for the prevention of the deadly virus, with the need to address the dilemma with truthful and timely information (WHO, 2021).

In order to inform and educate the public effectively about the pandemic and to guide behavioural changes on how to combat the resurgence of such a global epidemic, communication campaigns on social media have been cited as one of the most effective non-pharmaceutical interventions (Polack et al., 2020). Undoubtedly, social media has in recent times been the fastest means of reaching out to people within the shortest possible time (Bowd, 2016). This is because virtually all adult literate citizens around the world are social media subscribers (Nwammuo and Nwachukwu, 2021). A key strength of social media is that it reaches citizens remotely and, at the same time, provides an opportunity for them to ask questions and get immediate responses from the source (Togun, 2020).

As one of the fastest means of reaching a large and highly diversified audience, the Nigeria Centre for Disease Control (NCDC), in their wise decision on how best to reach out to Nigerians and pass across coronavirus health safety measures, opened a Twitter account from where they sent messages on the virus to the people. This was because health information, according to Kreps (2001), is essential in healthcare and health safety measure promotion, especially in a health emergency situation like the COVID-19 era. The ability of health information to provide the public with the direction and rationale for guiding strategic health behaviours, treatments, and decisions makes health information an indispensable element of health communication during health emergency situations. Specifically, it was observed that the COVID-19 pandemic gave the Nigerian Centre for Disease Control (NCDC) ample opportunity to make appreciable use of social media, particularly Twitter, for health communication and engagement with the people (Obayi, 2022). The NCDC, as mandated by Nigerian law (Act 2018, as amended), is the only statutory agency in the Ministry of Health tasked with the responsibility of detecting, preventing, and controlling diseases of public health. It also collects, analyses, and interprets data on diseases of public health importance (NCDC, 2023).

The use of Twitter by the NCDC and other health agencies has undoubtedly enhanced health communication efficiency. Consequently, several research studies (Abiola, Abayomi, Alli and Arogundade, 2023; Obayi, 2022; Silubonde, Draper and Norris, 2022; Samuel et. al, 2020) have been conducted to examine the use of social media for health communication. For example, Adamska, et al. (2023) examined "Sentiment analysis of COVID-19 tweets from selected hashtags in Nigeria using VADER and TextBlob analyzer," revealing that information from social media may be used to help organisations, governments, and nations around the world make smart and effective decisions about how to restrict and limit the negative effects of COVID-19. In another study, Obayi (2022) examined "Twitter Coverage of the COVID-19 Pandemic: Analysis of Facts, Fear Appeal, and Fake News." Obayi analysed how NCDC, Nigerian politicians, and celebrities shared information on Twitter from February 27th, 2020, to April 30th, 2020. Using content analysis, the study analysed the direction of coverage, language, and tone of coverage, as well as the dominant frames used in the NCDC and popular Twitter handles. The researchers concluded that there was a significant difference between the frames; however, there was not much significance between the handles in the direction, tone, and language of coverage.

Furthermore, to better understand health behaviours in the context of COVID-19, Silubonde, Draper and Norris (2022) conducted a qualitative study aiming to investigate perceptions related to the COVID-19 pandemic among the South African adult population. The study, which identified 10 themes, revealed that participants generally reported an understanding and appreciation of the preventative measures put in place by the government. However, the findings also showed that a lack of trust in the government, government communication of specific scientific information around COVID-19, and the pervasiveness of social media had affected the implementation of preventative measures. Moreover, the impacts of the pandemic were reported to vary with socio-economic level. Samuel, et al. (2020) also collected tweets related to COVID-19 to understand the fear sentiment among online users, particularly during the peak time of COVID-19 in the United States. The study identified public sentiment associated with the pandemic using coronavirus-specific tweets and R statistical software, along with its sentiment analysis packages. The study observed strong classification accuracy in identifying public sentiment associated with the pandemic using coronavirus-specific tweets and R statistical software.

In addition to the cited studies, Shen, et al. (2020) also investigated mentions of symptoms and diseases on social media to predict COVID-19 case counts, while Huanget al. (2020) on their own analysed social media posts to study the characteristics of COVID-19 patients in China. However, both of these studies focused primarily on China. More so, Park et al. (2020) addressed information transmission networks and news-sharing behaviours on Twitter regarding COVID-19 in Korea. Abd-Alrazaq et al. (2020) conducted an infoveillance study on aspects of the COVID-19 pandemic, aiming to study the main topics of discussion related to the disease. Chen et al. (2020) presented basic statistics that tracked only Twitter activity responding and reacting to COVID-19-related events. Lewin, et al. (2020) studied Twitter users' public emotional responses to COVID-19, focusing on four basic emotions only. The scanty nature of literature on the Nigeria experience and NCDC campaign activities regarding Twitter usage for health communication underlined the current study.

Literature Review

Social media platforms like Facebook, Twitter, Instagram, and YouTube have replaced traditional public communication channels, such as newspapers, television, and radio, as the primary means of communication (Piltch-Loeb et al., 2021). Social media allows users to become information sources (Shao, 2009), with the flexibility to share unverified information (Kircaburun et al., 2020). However, the open nature of the internet turns social media into a double-edged sword, where both critical and false information can be disseminated. Twitter users send direct messages or retweet messages (Odlum and Yoon, 2015). In Nigeria, Twitter has 30.4% of all social media users, making it the second-largest social networking site behind Facebook. Its usage has increased by 6.33% since the first coronavirus case in February 2020 (GlobalStats, 2020). Twitter has been seen as a developing medium for public health education and news, particularly during the H1N1 pandemic in 2009 and the Ebola virus disease outbreak in 2014 (Odlum and Yoon, 2015). Its young user base is known for creativity and experimentation (Adebisi et al., 2020). Twitter's utility supports its role in influencing public health outbreak surveillance (Odlumand Yoon, 2015). While Twitter users may not have the same knowledge as health experts, their tweets often reflect public sentiment and offer opportunities for health groups and governments to share reliable information and develop effective strategies. Many academics have discussed Twitter's significance in engaging people in health topics.

One of the special and unique identities of Twitter is the tagging feature using the symbol #. According to Laucuka (2018), social media platforms, particularly Twitter, use the symbol (#) to denote discussions about particular subjects. Examples like #vegan, #FIFAcup2014, and #LinkinPark offer various perspectives on relevant topics. Hashtags create 'searchable language,' allowing users to categorise and collect words and phrases into lexicons they can incorporate into their messages (Zappavigna, 2011). Wikstrom (2014) explored hashtags from a linguistic pragmatics perspective, highlighting their diverse uses beyond labeling. They can be structured, gamified, and serve as meta-comments (Wikstrom, 2014). Zappavigna (2015) examined three functions: marking experiential topics, enacting interpersonal relationships, organising text, using social semiotics, and analysing a massive Twitter corpus. Twitter users have repurposed hashtags for various uses, at times diverging from their original purpose (Wikstrom, 2014). When users click on a hashtag, they instantly access relevant tweets, posts, or photos, depending on the platform (Laucuka, 2018). Hashtags not only categorise but also foster broader discussions on Twitter, in addition to their topic-marking role (van den Berg, 2014). Many Twitter users, especially those in public health communication, use hashtags to engage with others and monitor discussions about their topics (Adamska, 2015).

The increased use of social media is now recognised as a crucial tool for disseminating public health information. It may be essential to reach the growing portion of the population abandoning traditional media as internet technology adoption rises, complementing radio, TV, and newspapers in spreading public health messages (Smith & Brenner, 2015). Twitter, according to Harris et al. (2014), is more prevalent among demographic groups challenging to reach through traditional media, such as youth, African Americans, and Hispanics. Social networking sites have evolved into effective resources for health-related information searches (Jamal et al., 2021). Social media serves as a potent tool for influencing people's ideas and attitudes (Saha et al., 2019), significantly advancing public health knowledge and advocacy (Jiménez-Hidalgo et al., 2023). These platforms have a considerable impact on modifying attitudes, intentions, and health-related behaviors. Health information and literacy are vital for informed health decisions (Canela-Soler, 2010). Health communication enhances the health industry through effective verbal, written, and visual communication tactics (Jiménez-Hidalgo et al., 2023; Mheidly and Fares, 2020). Social networks offer tools for information sharing, healthcare debates, promoting healthy behaviours, engaging with the public, and educating various stakeholders (Ventola, 2014; Islam et al., 2020; Eysenbach, 2020).

With massive user bases on platforms like Twitter (544 million), YouTube (2.51 billion), and Instagram (1.38 billion), social networks play a critical role in spreading health information (Statista, 2023). Integrating these tools into public health objectives can help inform and educate the population while involving healthcare professionals (Jiménez-Hidalgo et al., 2023). Twitter, with its 140-character "tweets," has a broad influence due to social multiplier effects (McClellan, 2017). Users can retweet, comment, and follow others, fostering communication. Hashtags, denoted by "#" (e.g., "#depression"), categorise tweets and enable topic-specific exploration, making Twitter a valuable source for diverse perspectives, including public health. Scholars have analysed Twitter's role in agenda setting, health crisis coverage (Skogerbo and Krumsvik, 2015; Lefky et al., 2015), and user motivations (Chen, 2011; Lee, Oh and Kim, 2013). During health crises, Twitter is used for expression and sensitization by individuals and institutions (Hosch-Dayican et al., 2016). Social media is used by public health groups in addition to traditional media to educate people about the pandemic and other diseases affecting public health (Payton and Conley, 2014). Twitter is a tool that the NCDC as a whole employs to inform and raise awareness among the public (Nigerian Centre for Disease Control, 2023). In addition, well-known people like politicians and celebrities repost the NCDC's post on COVID-19 to connect with their followers and keep them updated on the situation (Obayi, 2022). Twitter has been used to engage individuals in health education, along with other social media channels. Twitter was named as one of the social media platforms by Sobaci and Karkin (2013) as a way to increase participation, transparency, and democratic ideals. The Nigerian Centre for Disease Control (NCDC) uses social media to spread information in order to supplement information also distributed through the mainstream media. The goal is to increase the audience for the material and establish a venue for interaction and feedback (Caplehorne, 2018).

However, controversy and confusion have resulted from what has been referred to as COVID-19 misinformation due to the usage of Twitter by both official and non-government individuals to distribute information regarding COVID-19. Obayi (2022) pointed out that the NCDC used its Twitter account to refute rumours and caution people against believing bogus news about the Corona virus as a response to that. In order to avoid receiving fake news, the Director General of the NCDC asked Nigerians to exclusively get their news from reputable websites and accounts (Obayi, 2022). According to the BBC fact-checking team (2020), bogus news on Twitter that sparked a social media outcry included the claim that vaccinations would be tested on Africans first (Obayi, 2022). The NCDC often shared information with the public via their Twitter account, @ncdc.gov. On social media, many messages are posted in an effort to influence Nigerians to act in a particular way (Obayi, 2022). Obayi claims that the majority of NCDC messages attempted to market the notion of "sitting at home" while educating the public about the virus. This demonstrates how the microblogging service Twitter is utilised to engage users in health communication and education.

Theoretical Justification: Framing Theory

The concept of framing focus on essence of the issue at hand, rather than on a particular topic. Framing theory was first put forth by Goffman in

1974. The theory assumes that people interpret what is going on around their world through the primary framework. It further rests on the proposition that the media focus attention on certain events and then place them within a field of meaning. According to Asemah, Nwammuo and Nkwam-Uwaoma (2017), the framing theory rests on the following basic assumptions:

i. A communication source selects some aspects of perceived reality and makes them more salient in a communicating text, so as to promote a particular issue at hand.
ii. How something is presented to the audience (frame) influences the choices people make about how to process that information.
iii. There should be a forum in which ideas about the social world are routinely presented and debated.
iv. News is presented to create a particular frame.
v. Communication (messages) comes with a frame which could be in terms of choice of language, the medium of the message or the audience the message is meant for.

Thus, the theory of framing resonates with the study under review in that Covid-19 pandemic is a critical public health issue which should be priortised in every media discourses. The fact that NCDC is a body saddled with the responsibility of disease control attests to the need to ensure all strategies are deployed towards reducing Covid-19 casualities to the barest minimum. Thus, NCDC's use of Twitter to engage people on Covid-19 pandemic through creation of awareness about the disease, sensitization of people on how to avoid contracting the disease, enlightenment on how to use the non-pharmaceutical interventions (NPI), among others are all geared towards creating a frame about the existence of Covid-19 pandemic, and how the people can be influenced towards behavioural change in terms of compliance with the various warnings as regards the virus.

Methodology

This study assesses the use of Twitter by NCDC during the Covid-19 pandemic. Using a qualitative research approach, this study adopts a thematic textual analysis research method. The justification for the adoption of the thematic textual analysis research method was as a result of the need to shed more light on Twitter discourse and engagement during the Covid-19 pandemic. The study also adopts purposive sampling techniques to selects tweets that would best address the research objectives of the study. The selected tweets were thematically analysed based on the research objectives of the study. Twitter is one of the social media platforms widely used by NCDC; hence, the study adopts NCDC generated data on Twitter in a bid to examine: the tweet contents; the level of Twitter engagement by NCDC during the Covid-19 pandemic; the Twitter Hashtag, and the stakeholders followed by NCDC. The study population consists of tweets that were made by NCDC between February 2020 and January 2021, using "https://Twitter.com/search-advanced and the advanced search tool. Thus 794 tweets were counted on NCDC's official Twitter page (@NCDCgov) this represents the number of tweets that were made by the Nigerian Center for Disease Control between February 2020 and January 2021. The researcher purposefully chose 8 tweets from each month that helped answer the research questions being examined. This means that a total of 96 tweets were chosen during the months of February 2020 and January 2021. 96 tweets therefore make up the study's sample size.

Results

The analysis of the tweets on the use of Twitter by NCDC during the Covid-19 pandemic in Nigeria revealed four themes, which were identified simultaneously by two independent reviewers. The three themes were identified as follows: Tweet Content, Twitter Hashtag and Level of Engagement.

Theme One: Tweet Content

Having a Twitter presence and being active on Twitter has suddenly become part of the communication strategy and mechanism of NCDC, as it provides timely and wider reach for Twitter users. Twitter is used by the health agency to share information (Ezeh and Mboso, 2018). Before the COVID-19 pandemic, the Nigeria Centre for Disease Control (NCDC) joined Facebook on January 17, 2016 and Twitter in March 2016.

Tweet content refers to the composition of a tweet or Twitter based message. After a critical examination of the activities of the NCDC vis-à-vis the contents of the tweets made by the agency, four sub-themes were further generated. They include: Casualties of COVID-19, Sensitization, Information Management and Schedule and Announcement of Activities of NCDC

a. Sub-theme One: Casualties of COVID-19

COVID-19 casualties are the cases and deaths of people affected by COVID-19 (UNICEF Dashboard, 2013). During the time of a pandemic, the actual authentic data on the number of cases and deaths of people infected with a disease is sometimes limited, which makes it challenging to understand the many ways in which people are being affected by the pandemic. To shed light on the situation, the NCDC official Twitter page presents regular confirmed COVID-19 cases and deaths. The NCDC, as part of their mandate, posted on their official Twitter handle (@NCDC.gov.ng) on February 28, 2020, that the Honourable Minister of Health has announced a confirmed coronavirus disease (Covid-19) case in Lagos State. The case, which was confirmed on February 27, 2020, is the first to be reported in Nigeria since the beginning of the outbreak in China in January 2020.The NCDC also tweeted on Twitter about the COVID-19 situation report in Nigeria that is published by the NCDC daily to inform Nigerians of the status of COVID-19 in the country, in terms of the testing rate, the number of discharges and what the peoples should do to limit the spread of the disease. The situation report is a daily national situation output of the NCDC that is published with a summary of the epidemiological situation and response activities in the country. The tweet contains a link via which users can read the full report.

b. Sub-theme Two: Sensitization

After the declaration of COVID-19 disease as a pandemic and the announcement of the first case in Nigeria, the NCDC led the coordination of all efforts towards COVID-19 and other Anti-Microbial Resistance (AMR) activities in the country. Apart from the development of the National Action Plan for AMR, NCDC has continued to work with relevant stakeholders and partners, such as relevant ministries, departments, and agencies, WHO, media houses, nongovernmental organisations, and others, to ensure adequate COVID-19 education and awareness creation for the people through different media platforms, most especially Twitter (NCDC Dashboard, 2023).The NCDC tweet on March 9, 2020, highlighted some of the prevention and precautionary measures with which people can protect themselves from COVID-19 disease. The tweet was important for the public to not panic and protect their lives.

The NCDC also engaged the service of popular figures, celebrity, influencer and others in the society for media campaign using indigenous language to educate and convince the populace on the need to focus and protect themselves from the corona virus disease. This shows that NCDC strives to communicate with their target audience in the language that they understand well and better. It shows they do message segmentation to enhance the effectiveness of the message that they are passing down to the populace. One cap fits all message dissemination doesn’t work anymore. In order to gain message salience, there is a need to use the language that people understands to reach them.

c. Sub-theme three: Information Management

The NCDC, as part of their Twitter campaign, tweeted against the sharing of fake news in the form of voice notes, broadcasts, WhatsApp, and other social media. The implication of this tweet is for people to stop sharing unverified information about the COVID-19 disease. Fake information on social media has become a herculean task for the health agency to eradicate because such fake information is developed and shared with the intent of causing fear and panic among the people. The NCDC, through their media campaign, disseminated information on COVID-19, thereby creating awareness about the disease and some of the precautionary measures to take to protect lives. The NCDC also tweeted about the unverified information on the use of local drugs and substances to cure COVID-19. The NCDC sensitized the people through their update on Twitter on the need to desist from consuming hot lemon, palm oil, ginger, garlic, etc. This tweet was necessary considering the fear and panic among the populace and the arbitrary use of local substances to treat COVID-19 disease. The NCDC also educates people about COVID-19: hot lemons do not kill the Corona virus; eating garlic and ginger does not kill the Corona virus; special oils do not kill the Corona virus, etc. The NCDC also persuaded the people through their tweet against the use of chloroquine and its derivatives for the management of coronavirus disease, which has not been validated and approved. The tweet is important for people to desist from self-medication and misuse of drugs, which can cause harm and death.

D. Sub theme four: Schedule and Announcement of Activities of NCDC

Announcement of schedule of activities is one of the key components of the NCDC Covid-19 function on Twitter. The announcement usually came with the release of time-tables and schedule of activities for the upcoming activities or function the agency is embarking upon. After the breakout of the Covid-19 Pandemic in Nigeria, the NCDC who according to the constitution is in charge of the management of infectious diseases put in place measures and facilities to curb and mitigate the disease. The health agency tweeted some of their impending activities and functions on twitter on regular bases.

As part of NCDC mandate to coordinate, manage and prevent the spread of Covid-19 disease, the National COVID-19 Emergency Operations Center (EOC), activated on the 28th of February at the highest level, has been meeting daily to coordinate response activities in line with the Covid-19 Incident Action Plan (IAP). Some of the activities that have been implemented so far include: Strengthening and expansion of Covid-19 laboratory diagnostic capacity. Prior the Covid-19 Pandemic, Nigeria had five laboratories with capacity to test for Covid-19 in the country; Deployment of Rapid Response Teams (RRT) to support response activities in Lagos and Ogun States; recruitment and deployment of ad-hoc officers to support screening and contact tracing activities in Ogun States and high priority states with international airports including Lagos State; Training of states' healthcare workers on infection prevention and control (IPC); sample collection and testing; and clinical management of Covid-19; Daily epidemic intelligence meeting for continuous risk assessment to provide information for follow-up action(s); Intensive risk communication including press releases, radio jingles, media appearances etc; Deployment of guidelines for IPC, case management, schools, mass gatherings etc.

The NCDC among others tweets that both national and state government must work together in the fight against Covid-19 pandemic. All effort should be coordinated for containment, including active surveillance, early detection, isolation and case management, contact tracing and prevention of onward spread of the Covid-19 infection. This is necessary in view of the limited capacity of Nigerian health system to contain the pandemic and the little effort shown by some state in galvanizing all effort to end the spread of the disease.

Theme Two: Twitter Hashtag

A search through the official Twitter page of @NCDCgov shows that there are many hashtags used, but the popular hashtags adopted by NCDC on their official Twitter account during the COVID-19 pandemic include #COVID-19, #TakeResponsibility, and #COVID-19Nigeria. As part of the efforts to curb the spread of coronavirus, the NCDC used #TakeResponsibity in their tweets on September 14, 2020, to inform people of the need to take responsibility by following all the specified guidelines. The #TakeResponsibility symbol symbolises and encompasses the campaign message of the NCDC regarding the Corona virus disease. It is used to convey sentiments, interest, and action on the need to be responsible in adhering to the measures put in place to protect the lives of the people.The NCDC uses #Covid-19 when they announce on March 23, 2020, the first official confirmed Covid-19 death in Nigeria. The use of #Covid-19 by the NCDC in their tweet continues the awareness creation about the coronavirus disease in the country. The hashtag is used to pass a message to online users. #COVID-19Nigeria was used by the NCDC in their tweet on the daily situation report of the COVID-19 pandemic in Nigeria. The #COVID-19Nigeria could mean the Corona virus disease still exists in Nigeria; therefore, Nigerians must take responsibility. The daily situation report contains the epidemiological activities of the agency, and #COVID-19Nigeria affords the NCDC the means to inform the people and empower them with adequate information about COVID-19 casualties in Nigeria.

Theme Three: Level of Engagement

The theme of the level of engagement of NCDC during the COVID-19 pandemic is divided into four sub-themes: retweets, likes, quoted tweets, and replies.

a. Sub theme One: Like

The Twitter Like feature enables Twitter users to show appreciation for a tweet. It is a means of giving someone a virtual pat on the back. On Twitter, users usually click on the “Like” feature when they see a tweet that they find fascinating. Unlike the “Retweet” feature, like is a way of showing appreciation for the content of a tweet, but not enough to share on your own timeline for your followers to see. The Twitter “Like” feature can be likened to the “Like” feature on LinkedIn, Facebook, and Instagram. The five tweets made in the month of February 2020 focused on the announcement of the first confirmed COVID-19 cases in Nigeria, with the highest number of engagements of 4380 "likes." This shows that a number of Nigerians got the message about the COVID-19 virus. In the month of March, 1148 tweets were made; however, the tweet with the highest number of likes was the one that announced the first COVID-19 death in Nigeria. Hence, this tweet marks the beginning of the mortality of COVID-19 in Nigeria. This made many people pay more attention to the tweets of the NCDC.

The tweets in March and April focused on the new COVID-19 cases in Nigeria. This made it have the highest number of engagements, with 13,700 likes and 9,901 likes in March and April, respectively. This showed that many people gave these tweets attention, and many expressed shocks at the rate of increase in the COVID-19 case. The months of February 2020 and January 2021 also focused on various announcements of the new COVID 19, which had a high number of engagements with 9,901, 2975, and 1623 likes, respectively. In *August 2020*, the tweet on the press briefing of the PTFCovid-19 Chairman, Boss Mustapha, had the highest number of engagements, with 127 “likes” for the month. The October tweet posted on the new COVID-19 case update of October 4, 2020 has the highest engagement with 544 likes. The implication of this is that the reactions that followed the tweet are moderate, though not high. The tweets in November focused on “Guidelines for Employers and Businesses in Nigeria,” which provided a link that highlighted what employers and businesses in Nigeria can do to reduce the risk of COVID-19 spreading in the workplace. The tweet has about 69 likes. The researchers observed from the analysis of the tweets that generally, the NCDC tweet received a high acceptance rate through the indicator "like." However, it was observed that the likes for NCDC tweets started reducing as the agency continued to tweet online. The reduction can, however, be linked to different factors, such as lack of interest in or disbelief in the COVID-19 disease, among others.

Sub-theme Two: Reply

A reply is a response to another person’s tweet. You can reply by clicking or tapping the reply icon in a tweet. When you reply to someone else, your tweet will show the message “Replying to..." when viewed in your profile page timeline. When someone replies to one of your tweets, you will see “Replying to you” above the tweet, and you will receive notifications. The five tweets for the month of February focused on the announcement of COVID-19 cases. There were 480 “replies” to that tweet, and the majority of the commenters expressed their fear of the lack of adequate capacity of the Nigerian government to tackle the pandemic considering our experiences during the previous epidemic in Nigeria. The majority of those who commented were, however, hopeful and full of encouragement for the NCDC and other relevant agencies to do their best to limit the spread of the disease.

The tweets of March and April showed the determination of the NCDC to provide constant information on the COVID-19 case on Twitter. The majority of people that commented showed mixed reactions to the issue, while some people raised concern about the fact that COVID-19 is increasing, but some people on Twitter still doubt the existence of the disease in Nigeria. The replies to the tweet in May and June were primarily focused on the negative perception of the people towards the Nigerian government, considering the continuous increase in the COVID-19 case. Some of the commentators, however, enjoined people to abide by the protective measures to safeguard their lives. While some were reiterating the need to take responsibility and be safe, others were talking about other things different from COVID-19 entirely, such as looking for followership, etc. The tweet in July focused on the new 575 COVID-19 case of July 10, 2020, which has the highest number of engagements. The majority of the replies focused on dissatisfaction with the process of managing COVID-19, particularly the lockdown. Some of the commenters even suggested that the federal government should encourage the use of herbal medicines to cure the disease. Many people also express doubt about the genuineness of the presence of the disease in Nigeria.

The tweet, which was posted on September 20, 2020, has the highest engagement with 25 replies. This followed the NCDC tweet claiming that "*there is no scientific evidence that disinfectant tags, often known as 'Air Doctor' can protect people against COVID-19"*. While the tweet posted on the new COVID-19 case update of October 4, 2020 has the highest engagement with 79 quote tweets. The implication of this is that the reactions that follow the tweet are moderate, though not high. One of the tweets in November was on Guidelines for Employers and Businesses in Nigeria which provided a link that highlighted what employers and businesses in Nigeria can do to reduce the risk of COVID-19 spreading in the workplace. December 2020 tweet focused on the new COVID-19 501 cases has the highest engagement with 66 "quote tweets." The implication of this is that the tweet has a moderate engagement level.

Sub-theme Three: Quoted Tweet

On Twitter, "Quoted Tweet" allows Twitter users to make a tweet along with the retweet while showing people the original tweet. The "Quoted" feature was added to Twitter in 2015. When you quote a tweet, you have the option of adding your own comment to the original tweet while also maintaining the original tweet and allowing your followers to see both the comment you added and the original tweet. In total, 148 tweets were made in March, while the tweet made on March 23, 2020, on the first COVID-19 death in Nigeria had the highest number of engagements with 1303 quote tweets. The tweet on the announcement of new COVID-19 cases in Nigeria has the highest number of engagements, with 2605 "quote tweets" for the month of May. A user, @Ly_kabir, tweeted, "*If this keeps on increasing, we don't have the facilities to contain the cases. Do yours a favour and stay at home even if your state isn't on lockdown.* Another user, @vanderturnt, said in his quote tweet that "the new case of COVID-19 in Kaduna State is in Zaria. The NCDC tweet on 348 new COVID-19 cases, which was posted on June 3, *2020*, had the highest engagement that month with 350 quotes.

The tweet, which was on the new 438 COVID-19 case of July 25, 2020, has the highest number of engagements with 418 "quote tweets." The majority of the comments in the quote tweet focused on dissatisfaction with the process of managing COVID-19, particularly the lockdown. Some of the Twitter users suggested that the federal government should try herbal medicines to cure the disease. Many users also expressed doubt on the genuineness of the presence of the disease in Nigeria.The August tweet on the COVID-19 situation report had 44 "quote tweets" for the month. A user, @Chikwe_I, who was also the DG of the NCDC, then tweeted, "Recently, we provided guidance to states to report cases that have recovered but were managed at home". Another user, @babasands, said, "They explained it here, though. I don't blame us for being suspicious of the government, but I believe that with regards to the Rona, we are doing our best to report."

Furthermore, the tweet posted on "the new COVID-19 case update of October 4, 2020 has the highest engagement with 79 "quote tweets." This shows that the reactions that follow the tweet are moderate, though not high. The December tweet, which is on the new COVID-19 501 cases, has the highest engagement with 66 "quote tweets." The implication of this is that the tweet has a moderate engagement level. The January tweet on Nigeria, which reached 100,000 case milestones, had the highest number of engagements, with 18 quote tweets for the month. The replies to the tweet came with mixed reactions. While some of the commenters fault the government for the announcement and allege COVID-19 was a lie, others lament how the government closed the higher institutions in the country. Some also raised concern about the slow testing and release of the COVID-19 disease.

Sub-theme Four: Retweet

"Retweet" is one of the features of Twitter. It is a feature that makes Twitter interesting and engaging. A retweet is a feature that allows someone to repost a tweet. The Twitter retweet feature encourages sharing another person's tweet with your followers. One's tweet can also be retweeted. Retweets enhance engagement and have a wider reach. Retweets are an effective measure of Twitter engagement by determining interests and preferences among followers. All the tweets made by the NCDC between February and 2020 focused on the announcement of the first confirmed COVID-19 case in Nigeria. This had the highest number of engagements, with 5753 "Retweets. The majority of those who commented expressed their fear of the lack of adequate capacity of the Nigerian government to tackle the pandemic, considering their experiences during the previous epidemic in Nigeria. For the month of *March 2020*, 148 tweets were made during this period. The tweet, which is about the first COVID-19 death in Nigeria, has the highest number of engagements, with 9752 "Retweets. Some of the commentators were full of appreciation for the NCDC's overwhelming task. The majority of those who made the comments encouraged the health agency to avoid any lapses by living up to task and ensuring test results are processed in a timely manner.

In *April 2020,* a tweet announced that 86 new confirmed cases of COVID-19 had the highest number of engagements, with 11,600 "Retweets, 6217. The retweets to the tweet expressed shock at the increase in the number of COVID-19 cases. The tweets showed the determination of the NCDC to constantly disseminate information about the COVID-19 case on Twitter. The majority of people who commented showed mixed reactions, while some people raised concern about the high prevalence of COVID-19.In May, the announcement of new COVID-19 cases in Nigeria led to the highest number of engagements, with 7492 "retweets."The retweets to the tweet focused primarily on the negative perception of the people towards the Nigerian government, considering the continuous increase in the COVID-19 case. Some of the commentators, however, enjoined people to abide by the protective measures to safeguard their lives.

The tweets of June 3 *and July 2020 had* the highest engagement that month, with 2154 and 1249 retweets, respectively. However, the majority of the commenters on the retweets showed different reactions in their replies. While some were reiterating the need to take responsibility and be safe, others were talking about other issues different from COVID-19 entirely. The majority of the comments in July focused on dissatisfaction with the process of managing COVID-19, particularly the lockdown. Some even suggest that the federal government should try herbal medicines to cure the disease. Many people also express doubt about the genuineness of the presence of the disease in Nigeria. The October tweet, which was on the new COVID-19 case update, had the highest engagement with 353 "Retweets. This showed that the reactions that followed the tweet were moderate, though not high.

Discussion of Findings

Results from this study showed that the tweet contents of the NCDC during the COVID-19 pandemic revolved around COVID-19 casualties, the schedule and announcement of activities and responses of the NCDC, sensitization, COVID-19 precautionary measures, and combating fake news. In addition, the tweets contents are informative and participatory. Tweets on the regular updates on new COVID-19 cases entailed information on deaths, recovery, and others. Those on sensitization focused on awareness creation. This finding aligns with the findings of Obayi (2022) that the NCDC, during COVID-19 pandemic updates, posted issues like the number of confirmed cases, discharged cases, and deaths. Similarly, the findings of Farooq, Laato and Islam (2020) that the number of COVID-19 cases and fatalities continues to dominate media coverage across all channels, including news, radio, print, and social media, during the lockdown, with the main headlines often emphasizing the case and fatalities, further corroborates the findings of this study. This resonates with one of the assumptions of the framing concept that a communication source (NCDC) selects some aspects of perceived reality (Covid-19 pandemic) and makes them more salient in a communicating text (Twitter), so as to promote a particular issue at hand. Thus, this justify the use of framing theory to drive the study because Twitter usage by NCDC to engage the people on the existence of Covid-19 and how to avoid contracting it is a way of selecting certain issue out of numerous issues affecting humanity, and giving it a kind of salience.

Tweets on Sensitization on COVID-19 Precautionary Measures were also used persuasively to encourage and remind the Nigerian populace on what and what not to do during the pandemic. Likewise, tweets on combating fake news were used to educate and enlighten people on the facts about the COVID-19 pandemic. Santas (2021) corroborated this in his study, which found that the Nigerian government, through partnerships with INGOS such as USAID and many others, used social media platforms for COVID-19-related health communication campaigns. He reiterated that such campaigns were packaged to create awareness about the need for people to play their role in the fight against COVID-19. Onuegbu, Wogu, and Agbo (2022), in their studies on the impact of social media in the fight against the spread of coronavirus (COVID-19) in Anambra, found that social media was used by individuals, NGOs, and the government in the fight against the spread of coronavirus in Nigeria. In a study on the impact of media messages on the containment of the coronavirus pandemic in Nigeria, John (2023) confirmed that the majority of the respondents (75.49%) were satisfied with the overall performance of the media in their sensitization campaign.

The data in the study revealed that the tweet contents on persuasion failed to convince the uninterested populace of the need to fully follow the guidelines, especially during the lockdown. Also, the tweet contents on the COVID-19 case update revealed that the result of each individual case will be announced by each state of the federation. The justification for the announcement of individual cases by each state is, according to NCDC (2020), to respect and protect the privacy and rights of the patient.

Also, findings on the tweet contents of NCDC during the pandemic show that NCDC took advantage of Twitter to enhance its health communication. This was supported by Park, Reber, and Chon (2016), who noted that Twitter has transformed the manner in which health communication is understood and has positioned itself as an emerging space in the field of health communication. This is also in tandem with the assumption of framing that how something is presented to the audience (frame) influences the choices people make about processing such information (compliance). More so, it resonates with the proposition that there should be a forum in which ideas about the social world are routinely presented and debated. Thus, Twitter usage by the NCDC serves as a forum for presenting and debating the Covid-19 pandemic.

Having established the tweet content based on the analysis of Twitter usage by the Nigerian Centre for Disease Control during the COVID-19 pandemic, findings revealed that the hashtags used by the NCDC during the pandemic are #Covid-19, #TakeResponsibility, and “#Covid-19Nigeria”. #Covid-19 is one of the most trending global hashtags used during the COVID-19 pandemic. Findings show that #Covid-19 was highly used by the NCDC in their tweets during the pandemic. #Covid-19 usage on Twitter helps users get content regarding coronavirus disease on social media. It shows that regular uses of #Covid-19 on Twitter create an image and attachment for users when they come in contact with it. Analysis of the tweet also revealed that the use of #Covid-19 on Twitter and other social media became a symbol that encompassed everything about the Corona virus. Giannoulakis and Tsapatsoulis (2016) supported this finding when they suggested that hashtags help to accurately describe the intention of an image, which can be inferred through image annotation processes like crowdsourcing. Corroborating this, Vaishali and Rukmini (2021) describe hashtags as an expressing device that helps its users identify the tags as letters of various emotional mind spaces. It was also revealed that #Covid-19 was not only used by the NCDC in their tweets with regards to the COVID-19 pandemic, but Twitter users also use it whenever they want to comment on or reply to a message on the NCDC tweet. This creates a connection and fosters community building between the NCDC COVID-19 campaign and its users. Burns (2017) supported this in his study that hashtags have been useful in organizing people with shared interest, value, or belief who may not be socially connected; they also allow Twitter users to connect by interest in an expansive way.

Findings from the analysis show that NCDC does their regular communication campaign with #TakeResponsibility. The NCDC uses #TakeResponsibility for their regular campaign on Twitter to inform, educate, and create awareness about the need for the Nigerian populace to be responsible by following the prescribed measures and protocols put in place by the health agency and government. This corresponds with the findings of Ihekweazu, Ejibe, Kaduru, Disu, and Oyebanji (2022) that the #TakeResponsibility campaign by the NCDC sustained awareness about COVID-19 as the response moved from being health sector-led to a whole-of-society response, increasing the self-efficacy of citizens to take ownership of the response and comply with instituted preventive measures. The NCDC's efforts have formed the cornerstone of public health messaging on the COVID-19 pandemic in Nigeria. The NCDC communication approach leveraged social media, particularly Twitter, and other avenues to encourage Nigerians to take responsibility for protecting themselves and their loved ones and preventing the spread of COVID-19. Supporting this assertion, Santas (2021) asserted that there is a need to inform the public to prevent taking measures that may jeopardize their health, hence the health communication campaign.

In addition, the data in the study shows that #Covid-19Nigeria" was included in all the tweets made by the NCDC consistently during the pandemic in Nigeria. This act is in consonance with the position of Goswami (2018), who said hashtags are used as knowledge tags in advocating for a cause, connecting social media users to participate and voice for a campaign across platforms through a concisely designed message. This is also in consonance with the proposition of the framing theory that communication (messages) comes with a frame which could be in terms of choice of language, the medium of the message or the audience the message is meant for.

Findings on the level of engagement show that NCDC was able to create awareness about COVID-19, and they exhibited a high level of engagement with other users. Though findings show that the agency failed to interact and dialogue adequately with the users in some discourse, this was evidence from the analysis, as they rarely offered an answer to some of the questions asked or replied to some of the comments of people on their posts. Similarly, Ehondor and Unakalamba's (2021) study on public awareness and engagement of NCDC's social media use for crisis communications during the pandemic shows that there was low engagement in NCDC's crisis communication via Facebook. This, however, contradicts the claim of Watkin (2014) in his study that social media are most often interactive and dialogic. Another study by Marani et al. (2023) confirms the findings of this study: government institutions did use Twitter to provide information, but there was limited engagement and dialogue with the public during the pandemic.

The findings, however, show that the NCDC had the highest number of engagements when they announced the 385 confirmed COVID-19 cases in April. The tweet made by NCDC for the declaration has 11600 "Retweets, 6217 "Quote Tweets" and about 13700 "Likes".

Conclusion

The integration of Twitter into health communication has played a significant role in bringing policymakers into contact with the target population. The rapid increase in the usage of Twitter, combined with the increased usage of Twitter by the NCDC, is expected to bridge the communication gap in the health communication process, which will in turn serve as an ingredient to strengthen the health communication system. Capitalising on having one of the highest followerships on Twitter with over 1.3 million and using "#Covid-19Nigeria", NCDC took advantage of Twitter to enhance its health communication by engaging in informative and participatory health communication on Twitter. This showed that amongst government institutions or agencies, NCDC has one of the highest followerships on Twitter. NCDC exhibited a high level of engagement in tweeting about the activities and programmes of the agency to get Nigeria's populace aware of the agency's activities. Findings from the study evidently showcased the adoption of Twitter for COVID-19 and health communication by the NCDC, and it gives credence to the potency of social media in creating health awareness, education, enlightenment, persuasion, and information that would strengthen the beliefs of the populace in the health agency. The data in this study revealed that there is a need for NCDC to ensure adequate interactivity and dialogue with Twitter users to enhance the engagement of its posts.

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