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Implications of Twitter during its use in public health practice involving the distribution of the COVID-19 vaccine

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IMPLICATIONS OF TWITTER DURING ITS USE IN PUBLIC HEALTH PRACTICE INVOLVING THE DISTRIBUTION OF THE COVID-19 VACCINE

ABSTRACT

Introduction – There were 4.89 projected billion social media users in 2023. Social media platforms such as Twitter have allowed public health organizations to spread information regarding COVID-19 vaccines to the public. Twitter permits government organizations and public health agencies to release accurate information as a primary level of rapid communication.

Purpose – The purpose of this research was to explore the impact of the social media platform, Twitter, on public health information throughout the COVID-19 pandemic regarding the spread of information involving COVID-19 vaccine distribution to the public.

Methodology – This study utilized a literature review with a semi-structured survey with an industry expert. There were five databases used to collect resources. The references were reviewed and thirty-two were in the research with eleven sources used in the results section.

Results – The results overviewed Twitter as a public health tool, barriers to vaccine safety and vaccine hesitancy, and publicly offering thoughts on the COVID-19 vaccination and distribution numbers. Positive and negative dissemination of views on Twitter regarding the vaccine was evident.

Discussion/Conclusion – In conclusion, there was not enough evidence to show the number of vaccinated persons with the COVID-19 vaccine increasing due to the use of Twitter; however, Twitter would have continued to be utilized as a healthcare tool for reliable, credible sources for the public in regards to vaccine resources.

Key Words – 'COVID-19', 'Social Media', 'Twitter', 'Vaccinations'

INTRODUCTION

In 2023, over 7 billion people worldwide have populated Earth, and 4.89 billion persons have been projected to participate in social media (Dixon, 2022). Adaptations to the advancement and availability of social media's popularity have aided in connecting world leadership with public health experts, and then with the public with multiple platforms of effective media communication channels (Lee, 2015). Adult Internet users, around 70%, would be considered social media participants; therefore, social media could be considered a highly active mass media medium for consumers to digest public health information (Long, 2021). Building online community platforms where peers had discussed the hardships of current diseases they were enduring, such as COVID-19, would offer support and specific prevention strategies for others to try (Taggart et al., 2015). Public health information has been released on social media sites as a cost-effective interaction with the public on health promotion and the spread of public health information rapidly online through public accounts that would allow shareable features like retweeting on Twitter (Kilaru et al., 2014). Social media activity on platforms such as Twitter, Instagram, and LinkedIn, also aided in increasing the opportunity to extend prevention and treatment efforts to those in multiple geographical locations looking for public health guidance during times of distress (Taggart et al., 2015).

Healthcare organizations had offered their reliable, credible knowledge on social media platforms would allow for expansion into health information, education, and messaging for public empowerment and current disease surveillance (Ndumbe-eyoh & Mazzucco, 2016). Mass media would be described as one encouraging friend to social health communications that would

hope to share information virtually concerning research and development, health and social

behaviors, and data and statistical analysis; therefore, the Centers for Disease Control and

Prevention and the World Health Organization could both easily share information on their

Twitter platforms as a common media channel to promote public health information as the CDC

was found to be the most credible source compared to others like the presidential COVID-19

task forces (Long, 2021).

Two ideas have been important principal factors in public health social media

interactivity including content creation that would advocate users to share online and optimizing

this activity with contests, games, and user-generated content (Kilaru et al., 2014). Health

information dissemination to the public would be another purpose of the social media platform's

activity; therefore, there would be an influence from public health advocates, which over 85% of

respondents in a study mentioned social media as a valuable tool (Ndumbe-eyoh and Mazzucco,

2016). Twitter as a social platform could lead to information regarding the public's emotional

response to current public health crises like the COVID-19 pandemic (Dyer and Kolic, 2019).

Between March 1 and June 5, 2020, 85.04 million tweets about COVID-19 were posted

(Sharma et al., 2020). Twitter would be helpful to public health as a surveillance tool with

vaccines as the most popular research category at 43% of articles reviewed in public health

Twitter (Edo-Osagie et al., 2020). Twitter provided a public outlet for information to be shared in

emergencies leading to local, national, and global trending topics; however, it was difficult to say

who would lead the conversations in COVID-19 due to the vast data, but it was found that

between WHO and some Twitter users, there was a noticeably less interaction during public

health emergencies (Tahamtan, 2022). In February 2020, the CDC tweeted twice about the

community spread of COVID-19 which based on the data available was retweeted over 14,000

times (Wang et al., 2021). The CDC measured a total of 52,909,924 total updated boosted doses in February of 2023 or 16% of the total population in the U.S. as having an updated COVID-19 booster dose (CDC, 2023).

In the US, 78% of the population had received at least one dose of the COVID-19 vaccine, while 22% of the US population was still unvaccinated in 2022. (Ndugga et al., 2022) The continued struggle for individuals to become vaccinated with COVID-19 would have states struggling to reach their goal in the number of vaccinated versus unvaccinated populations (Viskupič et al., 2022). The severity of the impact of the COVID-19 pandemic on the U.S. has led to forms of vaccine mandates as well as monetary rewards have been a way to increase the number of vaccinated persons (Viskupič et al., 2022). There have been limited findings within these incentives to increase the number of vaccinated populations due to efficacy rates and these incentive programs do not address bigger issues such as vaccine hesitancy, which has involved how individuals are uncertain about receiving an immunization due to media, other opinions, or their subconscious, and access to healthcare barriers like individual built environment (Kim et al., 2023). Vaccine hesitancy has been an ongoing research characteristic studied during the COVID-19 pandemic in the U.S. (Kim et al., 2023).

World leaders have utilized social media as a primary communication discourse to update the public on their thoughts during the COVID-19 pandemic; inclusive, Twitter has been a platform that almost anyone could access would provide an avenue for the public to have a level of distrust with the information being discussed, criticized, and questioned during public health emergencies by political leaders (Li et al., 2021). The previous presidential administration contributed to spreading misinformation about the COVID-19 pandemic and would be identified as a significant political influence based on the Trump administration's Twitter. (Lyu et al.,

2021). Around 69% of adult Twitter users in the US would get their news from Twitter

compared to other media (Hughes and Wojicik, 2019). Twitter has been reported to drive

COVID-19 vaccine information and public emotional opinions on active news in mainstream

media (Lyu et al., 2021).

The purpose of this research was to explore the impact of the social media platform,

Twitter, on public health information throughout the COVID-19 pandemic regarding the spread

of information involving COVID-19 vaccine distribution to the public.

METHODOLOGY

The hypothesis was that turning to Twitter allowed public health agencies to put out reliable,

accurate information regarding the promotion of vaccines and vaccine safety during the COVID-

19 pandemic by utilizing Twitter and increased the number of vaccinated persons.

The intended methodology for this qualitative study was a literature review with a semi-

structured survey/interview with an experienced public health professional specializing in social

media with a public health account. The survey/interview would be conducted over email with a

public health professional who was employed in West Virginia by the West Virginia Department

of Health and Human Resources. There were 10 questions asked approved by the IRB and

informed confidential consents were completed over email, and then only relevant answers were

used to support this literature review. (See Appendix: Questions asked in Semi-structure IRB

Approved Survey)

When conducting this research, the inclusion criteria were literature published from the

years 2010-2023. Key words included within this literature research were 'Twitter' OR 'social

media' AND 'public health' OR 'COVID-19' AND 'vaccine' OR 'vaccine distribution.' These

keywords were also a part of the inclusion criteria. The electronic databases of Marshall University Library Academic Search Complete, PubMed, ProQuest, Google Scholar, and Public Health Database were utilized to obtain credible academic peer-reviewed literature for the research. The literature research was completed by M.C. and validated by A.C. who acted as a second reader and verified that the references of this literature met the research study inclusion criteria.

The conceptual framework would assist in explaining the course of the use of Twitter for public health agencies. For a healthier status of the population and public health information promotion available to the public, there would be a need for accurate, reliable accounts and resources available to the public on Twitter. These agencies need to participate on Twitter actively. There would be benefits and barriers to the concept. An example of a barrier would have been health literacy (see Figure 1. Adapted from Yao et al., 2010).

Using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses method (PRISMA), this search identified 533 relevant citations. and articles were excluded (N=513) if they did not meet inclusion principles. Articles were included (N=30) if they described the usage of Twitter in public health: articles from other sources (N=30) were also included in this search. These 32 references were subject to full-text review, and these 32 citations were included in the data abstraction and analysis. Of the 32 references totaled for research, only 11 references were used in the results section. (see Figure 2).

RESULTS

Utilization of Twitter as a Public Health Tool

According to the CDC's (2023) vaccine data tracker, vaccine data revealed that the total updated booster doses were 55,475,966 as of mid-April 2023. In West Virginia, the total number of fully vaccinated residents with an updated bivalent booster dose was 207,145 which would reveal 11.6% of the population with an updated vaccination (CDC, 2023). West Virginia had 1,071,090 residents who completed a primary series of COVID-19 vaccine doses; exactly, adults aged 18 and older of the total population of West Virginia have completed a primary vaccine series. According to the CDC (2023), 1,211,542 residents in West Virginia have received at least one dose of the vaccine which represents 67.6% of the total population. There have been 3,094,030 total doses administered in West Virginia. (CDC, 2023)

COVID-19 as a topic on Twitter indicated that 22.12% of the tweets were positive thoughts on COVID-19 while 77.88% were negative thoughts (Boon-Itt and Skunkan, 2020). Liew and Lee (2021) studied that 20.3% of tweets involved themes equating to the distribution of COVID-19 vaccines within the public population. Suarez-Lledo (2021) overviewed that Twitter was the most common data source being utilized as an outlet to cover a vast number of healthcare topics. Suarez-Lledo (2021) reported that only 3% of the studies overviewed were content with the quality and information released in these social networking techniques. Every state health department with a Twitter account tweeted at least once between October 19, 2020, and February 28, 2021, except Wyoming's state health department account, which has not been posted since 2019 (Bradford et al., 2022).

Barriers: Safety and Hesitancy in Vaccine Distribution

Based on results from 10,000 tweets including the language of 'health care service provider in a query led to 53.8% showed positive sentiment, 30.0% neutral sentiment, and 16.2%

negative sentiment (Agrawal et al., 2023). Based on results from 10,000 tweets including the language of 'COVID-19 vaccine' in a query led to 48.2% showed positive sentiment, 11.9% negative sentiment, and 39.9% neutral sentiment (Agrawal et al., 2023). The number of unique Twitter accounts engaged in vaccine opposition from 15 October 2019 - 14 February 2020 increased by 174.8% from 15 February 2020 to 14 June 2020 (Bonnevie, 2021).

The Delta variant outbreak increased cases which appeared in the study from Daghriri et al. (2023) that a positive correlation between positive tweets 0.768, about COVID-19 and immunizations had been reported during the previous Delta phase.

Social media articles regarding vaccination that would include potential side effects of vaccinations attributed to 14% in the study from Suarez-Lledo (2021). Many emotions through Twitter about the COVID-19 vaccine were conveyed including 21.19% of the studied tweets revealing fear as the top sentiment towards COVID-19 vaccines (Boon-Itt and Skunkan, 2020). The impact of vaccine concerns had been discussed within public concerns on the hesitation to receive a vaccine where 19.6% of tweets studied by Liew and Lee (2021) related to public concern compared to the 19.3% of tweets relating to emotional reactions in Twitter users.

Based on a study by Bradford et al. (2022), states categorized by the South region, including West Virginia, were tweeting a greater number of posts compared to others in the U.S. which would incorporate tweets about COVID-19 at 35.4% and vaccines at 34.7% of the number of tweets. Only .59% barely any information tweeted by the state health department's accounts included mistrusting terminology (Bradford et al.,2022).

Implications of Political Media Influence

According to Head et al. (2018), 911 individuals identified as liberal, 11,727 identified as moderate, and 882 identified as conservative; therefore, participants reported an overall liberal vaccination intent measured 5.65 to be willing to receive the COVID-19 vaccine. Followed by moderate identifying a 5.36 vaccination measurement level of intent identifying then conservative identifying of 5.24 which could lead to media targeting for certain messages advertised in specific communities. These measures were overall vaccination intention mean scores with liberal as the highest and conservative as the lowest measure (Head et al., 2018).

Daghriri et al. (2023) would have shown results from Rogers curve and then government reports that 73.2% of the US population had received the vaccine; however, according to Daghriri et al. (2023), the Rogers curve estimated 70.6% acceptance and receival of the vaccine leaving 1.5% and 2.6% higher reported immunization rates from 2020-2023 estimated could have been due to COVID-19 vaccine mandates imposed by the government or employers.

G7 leaders have been known to tweet about their views on the coronavirus which led to around 80% of the tweets being analyzed as informative as well as 23.6% of the tweets could lead Twitter users to official government resources (Tsao et al., 2021). A tweet from Boris Johnson that revolved around flattening the curve in 2020 attracted around 23.9 million views indicating how vast an audience Twitter could allow for users to intake COVID-19 information (Mututwa and Matsilele, 2020).

DISCUSSION

The purpose was to research the impact of the social media platform, Twitter, on public health information throughout the COVID-19 pandemic regarding information dissemination involving COVID-19 vaccine distribution to the public. The results of this review suggest that there would

not be enough evidence to justify that using Twitter as a social media platform to promote

COVID-19 vaccines increased the number of vaccinated individuals in the US while this

research supported Twitter use for accurate vaccine information dissemination.

Many hesitancies were tweeted about the fear during outbreaks and side effects from

immunizations. Social media and Twitter allowed for this public forum; therefore, thoughts from

the public, government leaders, and public health agencies were revealed during the push for

COVID-19 vaccine distribution. The use of credible information has been spread on Twitter but

this would not indicate the increase in vaccinated persons based on Twitter's database

The West Virginia Department of Health and Human Resources representative supported

some of the information found such as retweeting information from other public health

organizations that offered reliable information to be shared with the community. According to

the expert from DHHR, Twitter would be considered one of their strongest social media platform

followings allowing for information to be shared with a broad audience providing direct links to

documents and expansive information on preventative actions. Rapid achievement of herd

immunity to have decreased casualties could have helped in the creation and implementation of

the spread of public health knowledge to increase COVID-19 vaccination levels (Markoivc-

Denic, 2023). While COVID-19 is becoming endemic, this is a good way to look at other

potential events that will include vaccinations in the US. Social media has provided the

WVDHHR with a way to share information and has communicated necessary information

quickly to West Virginia locals, especially on urgent health concerns such as adapting news on

the COVID-19 pandemic.

Limitations

This literature review had multiple limitations. The use of Twitter as a social media platform has been a new research tool in the last two decades. The number of online databases used by the researcher could have bias involved. Another limitation has been that COVID-19 efforts are currently closing in the US and the public health emergency involving the COVID-19 pandemic has almost ended. The researcher and interviewed expert could have had bias play a role in this research, which is a possibility of bias a limitation.

Practical Implications

More research would need to be done to examine how Twitter impacted persons in the US in receiving the COVID-19 vaccine and continuing to have this effect on individuals. Twitter has been around for a couple of decades only.

CONCLUSION

As a result of the research, Twitter as a social media platform has provided a tool for resources and references in COVID-19 vaccinations. The results of the research did not indicate that Twitter led to an increase in the number of persons vaccinated with COVID-19 immunization in recent years; however, utilization of Twitter has been discussed as having a positive impact in public health agencies' use in reliable, accurate information communication of the promotion and distribution of the COVID-19 vaccine.