KIU Interdisciplinary Journal of Humanities and Social Sciences

EFFECT OF SOCIAL MEDIA ON CONTROL OF DISEASES IN KAMPALA, UGANDA: A STUDY OF TWITTER/X

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Citation: Nkalubo et al (2025). Challenges pertaining to the implementation of Competency-Based Curriculum in Tanzania: A narrative literature review. *KIU Interdisciplinary Journal of Humanities and Social Sciences, 6*(1), 173-193.

ABSTRACT

This study examined the use of social media in controlling diseases in Kampala Uganda. The objectives of this study were: to assess the role of Twitter/X in the dissemination of accurate health information during disease outbreaks in Kampala, Uganda, to examine the impact of misinformation spread via Twitter/X on public behavior and response during disease outbreaks in Kampala, Uganda, to analyze how social media, particularly Twitter/X, influences public trust in health authorities and adherence to disease control measures in Uganda and to explore the effectiveness of Twitter/X as a communication tool in raising awareness and promoting preventive measures during disease outbreaks in Kampala, Uganda. The research employed a mixed-methods approach, integrating both qualitative and quantitative research methods. A survey was conducted to collect quantitative data from social media users in Kampala, with a particular focus on those who actively engage with health-related content on Twitter/X. In addition to the survey, qualitative data were collected through semi-structured interviews with key informants such as public health officials, health communicators, social media managers, and influencers in Kampala. The findings revealed that Twitter/X is a crucial tool for disseminating information, especially during disease outbreaks although there were concerns that it is a site for misinformation. The study recommends the strengthening of monitoring of social media for potential misinformation, increasing engagement with social media audiences, partnering with influencers and media literacy campaigns among others.

Keywords: Social Media and Disease Control, Health Communication in Uganda, Kampala International University

INTRODUCTION

In recent years, social media platforms have become significant tools in disseminating information and shaping public opinion on various issues. One of the most crucial areas in which social media has made an impact is public health, particularly in disease control and prevention. In Uganda, social media platforms like Twitter/X have been pivotal in the country's response to public health crises, including the management of infectious diseases such as Ebola, COVID-19, and malaria. Twitter/X, with its real-time

updates and wide reach, offers an opportunity to understand how social media can be utilized for disease control, public awareness, and health education (Nasr, 2020).

In Uganda, where public health challenges remain prevalent, the government and health organizations have increasingly turned to social media platforms to complement traditional communication methods. The role of social media, specifically Twitter/X, in providing timely information during disease outbreaks has been recognized as a powerful tool in mobilizing communities, engaging health professionals, and reaching those who are often overlooked by conventional media outlets (Binns, 2018). The ability of social media to facilitate immediate interaction, share updates, and correct misinformation has made it an indispensable component of health communication strategies (Boudreau, 2021).

However, while social media platforms like Twitter/X have the potential to enhance disease control, there are concerns about their ability to spread misinformation, stoke panic, and create confusion during health crises. Studies have shown that the rapid circulation of false or unverified health information on social media can undermine public health responses, disrupt disease control measures, and lead to non-compliance with official health guidelines (Bragazzi, 2017). Thus, understanding the impact of social media on disease control requires a nuanced examination of both its benefits and risks in the context of public health crises in Uganda.

This study seeks to explore the effect of social media, particularly Twitter/X, on disease control in Kampala, Uganda. The primary focus is on how information shared on Twitter/X influences public behavior, health awareness, and response to government and health organization directives during outbreaks. By examining both the positive and negative impacts of social media during these outbreaks, this research aims to provide a comprehensive understanding of its role in disease control efforts in Uganda's capital.

The research will address the following key questions: (1) How does Twitter/X facilitate the dissemination of accurate health information during disease outbreaks in Kampala? (2) What are the effects of misinformation on public behavior and health response in the context of disease control? (3) How do social media platforms like Twitter/X influence public trust in health authorities and disease control measures in Uganda? Ultimately, this study will contribute to the growing body of literature on the role of social media in public health crises and provide insights into how platforms like Twitter/X can be better leveraged to support disease control efforts, mitigate misinformation, and foster public trust in health initiatives

Problem Statement

The advent of social media has revolutionized the way information is shared, offering both opportunities and challenges in public health management. In Uganda, social media platforms like Twitter/X have increasingly been leveraged for disease control, especially during outbreaks such as Ebola, COVID-19, and malaria. While these platforms allow for the rapid dissemination of information and engagement with the public, there are significant concerns regarding their role in spreading misinformation, causing public panic, and undermining health efforts. The ability of social media to facilitate quick, real-time updates can be both a blessing and a curse when it comes to controlling diseases, as misinformation can easily

spread and complicate disease control measures.

Despite the growing reliance on social media, there is limited research on how platforms like Twitter/X specifically contribute to disease control in the Ugandan context. It is unclear how social media influences public behavior during health crises, whether it enhances the effectiveness of health campaigns, or whether it exacerbates the challenges posed by misinformation. Furthermore, the extent to which social media shapes public trust in health authorities and influences adherence to disease control measures remains under-explored in Uganda.

This study aims to fill this gap by examining the effects of Twitter/X on disease control in Kampala, Uganda. Specifically, it will explore how accurate information shared on social media platforms influences public response during disease outbreaks, the role of misinformation in shaping public perception and behavior, and the impact of social media on trust in government health initiatives. The findings will provide valuable insights into how social media can be better utilized in Uganda's disease control strategies and how its risks can be mitigated to improve public health outcomes.

Objectives

The primary objectives of this study are as follows:

1) To assess the role of Twitter/X in the dissemination of accurate health information during disease outbreaks in Kampala, Uganda.
2) To examine the impact of misinformation spread via Twitter/X on public behavior and response during disease outbreaks in Kampala, Uganda.
3) To analyze how social media, particularly Twitter/X, influences public trust in health authorities and adherence to disease control measures in Uganda.
4) To explore the effectiveness of Twitter/X as a communication tool in raising awareness and promoting preventive measures during disease outbreaks in Kampala, Uganda.

Research Questions

The study will address the following research questions:

1) How does Twitter/X facilitate the dissemination of accurate health information during disease outbreaks in Kampala, Uganda?
2) What is the impact of misinformation on public behavior, health response, and compliance with disease control measures in Kampala, Uganda?
3) To what extent does social media influence public trust in health authorities and their initiatives during disease outbreaks in Uganda?
4) How effective is Twitter/X in raising public awareness and promoting preventive measures during disease outbreaks in Kampala, Uganda?

Hypotheses

The study will test the following hypotheses:

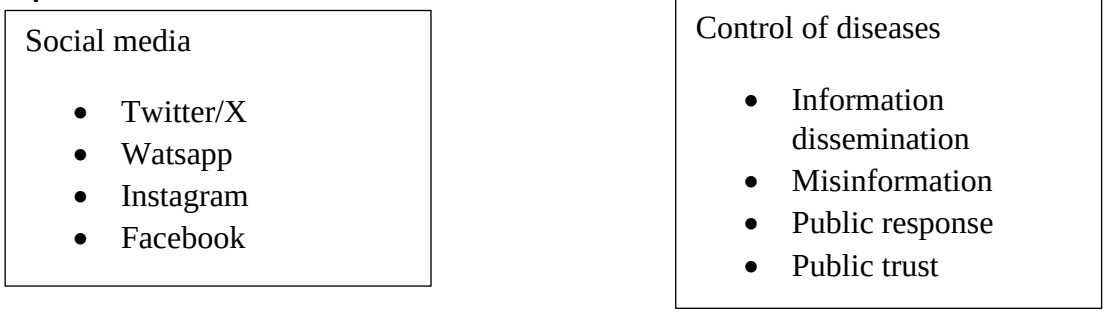
H1*:* There is a significant positive relationship between the use of Twitter/X for disseminating accurate health information and public awareness during disease outbreaks in Kampala, Uganda.

H2*:* The spread of misinformation on Twitter/X has a negative effect on public compliance with disease control measures in Kampala, Uganda.

H3*:* Twitter/X significantly influences public trust in health authorities and their disease control initiatives in Kampala, Uganda.

H4: Twitter/X has a positive impact on raising public awareness and promoting preventive health behaviors during disease outbreaks in Kampala, Uganda.

Conceptual Framework



The conceptual framework for this study is designed to illustrate the relationships between social media, disease control efforts, and public health outcomes. It consists of three key components: the role of Twitter/X as a tool for health communication, the spread of misinformation, and the public's response to disease control measures. This framework suggests that social media, particularly Twitter/X, can either positively or negatively influence disease control efforts depending on the nature of the information shared and how it is perceived by the public. It highlights the need for effective management of social media platforms to ensure that they are used to promote accurate health information and mitigate the spread of misinformation.

Theoretical Framework

This study will be guided by the **Social Cognitive Theory (SCT)**, developed by Albert Bandura, which emphasizes the role of observational learning, imitation, and modeling in shaping individual behavior. SCT posits that human behavior is influenced by interactions between personal factors, behaviors, and environmental stimuli. In the

context of this research, social media platforms such as Twitter/X can be seen as a significant environmental factor influencing public health behavior during disease outbreaks in Kampala, Uganda.

According to Bandura (1986), individuals learn and change their behaviors by observing others, especially when such behaviors are modeled by credible sources. Social media platforms, including Twitter/X, provide a virtual environment where health authorities, experts, and the public interact, exchanging information and shaping perceptions. Accurate health information shared on these platforms can influence public understanding of disease outbreaks and encourage health-promoting behaviors, such as vaccination or adherence to social distancing guidelines (Kaplan & Haenlein, 2010).

However, the theory also suggests that social media's influence can be dual-faceted. While it can promote positive health behaviors, misinformation spread on these platforms can lead to negative outcomes, such as public fear, confusion, and non-compliance with health measures (Chou, Hunt, Beckjord, Moser, & Hesse, 2009). The theory further posits that individuals are more likely to adopt behaviors they observe as being successful or beneficial. In the case of disease control, social media messages that highlight successful health interventions or endorsements from credible figures may encourage greater compliance with public health guidelines.

Thus, Social Cognitive Theory provides a comprehensive framework for understanding the ways in which Twitter/X can influence public health outcomes in Uganda, by analyzing both the positive and negative effects of social media on individual behaviors and public health interventions.

Literature Review

Social media has transformed the way information is disseminated and consumed, particularly in the context of public health communication. As platforms such as Twitter/X become integral to disease control efforts worldwide, it is essential to understand their role, both in promoting positive health behaviors and in managing the risks posed by misinformation. This literature review explores the role of social media, specifically Twitter/X, in disease control in Uganda, highlighting both the benefits and challenges associated with its use in public health initiatives.

The Role of Social Media in Disease Control

Social media, including Twitter/X, has become an essential tool for disseminating information during disease outbreaks. Its real-time nature allows for quick distribution of public health messages, enabling authorities to engage directly with the public, spread awareness, and provide up-to-date information on disease prevention and control. During the 2014 Ebola outbreak in West Africa, for example, social media platforms were used to disseminate health messages about the spread and prevention of the virus, reaching millions of people globally (Binns, 2018). Similarly, during the COVID-19 pandemic, Twitter/X played a pivotal role in informing the public about preventative measures, vaccination campaigns, and safety protocols, reaching audiences who may not have accessed traditional media outlets (Boudreau, 2021).

In Uganda, social media has been increasingly utilized in managing health crises, including the COVID-19 pandemic and Ebola outbreaks. According to Nasr (2020), the Ministry of Health in Uganda adopted social media to engage with the public during the Ebola outbreak, using platforms like Twitter to provide timely updates on disease hotspots, travel advisories, and safety measures. This immediate access to information is critical, especially in rapidly changing environments where quick decision-making is essential to containing outbreaks.

Moreover, social media's interactive nature allows for two-way communication. Health authorities can engage with the public, address concerns, and provide clarity on health guidelines, thus enhancing community participation in disease control efforts (Binns, 2018). For example, Ugandans on Twitter/X could pose questions to health experts or share their experiences and concerns regarding disease outbreaks, which were then addressed in real time.

The Impact of Misinformation on Disease Control

Despite its advantages, the use of social media for disease control is not without its challenges. One of the major risks associated with social media is the spread of misinformation and its potential to undermine public health initiatives. Misinformation, particularly related to disease outbreaks, can lead to confusion, fear, and harmful behaviors, such as avoiding vaccination or disregarding public health guidelines.

During the COVID-19 pandemic, misinformation about the virus, vaccines, and preventive measures circulated widely on platforms like Twitter. These falsehoods led to vaccine hesitancy, undermining

efforts to control the spread of the virus (Bragazzi, 2017). A similar pattern was observed during Uganda's Ebola outbreak, where false information about the virus's transmission and prevention measures caused confusion among the public, thereby hindering containment efforts (Nasr, 2020).

The speed at which misinformation spreads on social media is a significant concern. A study by Vosoughi, Roy, and Aral (2018) found that false news spreads significantly faster and reaches a larger audience than true news on Twitter, especially during moments of crisis. The rapid dissemination of misinformation can cause public panic, reduce adherence to official health guidelines, and contribute to the proliferation of risky behaviors, such as self-medication or the avoidance of medical treatment.

To mitigate these risks, health authorities must work alongside social media platforms to detect and correct misinformation. This involves the use of fact-checking, collaboration with social media influencers, and targeted campaigns to educate the public on the importance of relying on credible sources of information (Chou et al., 2009). In Uganda, health organizations have collaborated with the Ministry of Health to combat misinformation during disease outbreaks by countering false claims with verified facts and using social media influencers to promote accurate health information (Boudreau, 2021).

Social Media and Public Trust in Health Authorities

Public trust in health authorities is a critical factor in the success of disease control efforts. Social media platforms like Twitter/X can play a significant role in shaping or reinforcing public trust in health authorities. Research has shown that social media's direct and personal interaction with the public can strengthen the relationship between health authorities and the community, fostering trust and improving the effectiveness of public health initiatives (Binns, 2018).

In Uganda, the Ministry of Health has utilized Twitter to engage with the public during health crises, offering real-time updates on disease outbreaks and providing transparent information about the steps being taken to control the spread of diseases. This level of engagement can enhance the public's trust in health authorities, as it demonstrates that the authorities are responsive, accountable, and committed to addressing public concerns (Nasr, 2020).

However, public trust can also be undermined if misinformation spreads unchecked or if there is a lack of clarity in the messages conveyed. For example, during the Ebola outbreak in Uganda, conflicting messages from different stakeholders created confusion and led to a decline in public trust in the government's handling of the crisis (Boudreau, 2021). This highlights the need for consistency in communication and a unified response from health authorities.

The role of influencers and public figures on social media is also critical in building or diminishing trust. When trusted individuals, such as healthcare professionals or respected community leaders, share accurate health information on Twitter/X, they can lend credibility to the information being disseminated and influence the public's response (Kaplan & Haenlein, 2010). In contrast, the endorsement of unverified information by influential figures can have the opposite effect, eroding trust in health authorities and causing confusion among the public.

Social Media and Health Behavior Change

Another area of interest is the ability of social media to promote health behavior change, particularly during disease outbreaks. Social media platforms, including Twitter/X, have been shown to be effective in motivating individuals to adopt health-promoting behaviors, such as vaccination, hygiene practices, and seeking medical care.

During the COVID-19 pandemic, social media campaigns promoting handwashing, mask-wearing, and vaccination were critical in influencing public behavior and encouraging adherence to public health guidelines (Boudreau, 2021). Twitter/X served as a platform for these campaigns, where health messages were amplified through retweets, hashtags, and viral content. The ability to reach a large audience and encourage collective action was one of the strengths of social media during the pandemic.

In Uganda, health campaigns on Twitter/X have been used to raise awareness about malaria, vaccination campaigns, and other health initiatives. The engagement of the public through interactive content, such as polls, quizzes, and health challenges, has helped to sustain interest in health messages and motivate behavior change. Social media has also enabled the government and health organizations to target specific groups, such as youth or rural communities, with tailored messages designed to promote disease prevention and control.

Methodology

The research employed a mixed-methods approach, integrating both qualitative and quantitative research methods to provide a comprehensive understanding of how social media platforms contribute to public health initiatives, disease awareness, and management efforts in Kampala. A survey design was used to collect quantitative data from social media users in Kampala, with a particular focus on those who actively engage with health-related content on Twitter/X. The sampling technique used was stratified random sampling to ensure representation from various demographic groups, including health professionals, citizens, and social media influencers. A structured questionnaire was developed, which aimed to assess the frequency and nature of participants' engagement with health-related posts on Twitter/X, their perceptions of the platform's role in disease awareness and control, and their experiences with using social media for health-related information. The questionnaire included both closed and open-ended questions, which explored the effectiveness of social media in spreading health information, mobilizing action, and promoting disease prevention and control measures.

In addition to the survey, qualitative data were collected through semi-structured interviews with key informants such as public health officials, health communicators, social media managers, and influencers in Kampala. These interviews provided deeper insights into the strategies employed by public health agencies and social media influencers to utilize Twitter/X for disease control and awareness campaigns. The interview guide was designed to explore the challenges and successes in using social media for public health messaging, the relationship between social media content and actual behavior

change, and the role of social media in fostering public accountability in health management. Informants were purposively selected based on their involvement in public health initiatives and social media engagement.

Data analysis was performed in two stages. First, the quantitative data from the surveys were analyzed using descriptive statistics such as frequencies, percentages, and mean scores to assess the impact of Twitter/X on public health behaviors and perceptions of disease control in Kampala. The analysis focused on identifying trends in users' engagement with health-related content and the perceived effectiveness of Twitter/X in promoting public health messages. Second, the qualitative data from the interviews were analyzed thematically, identifying key themes related to the strategies used in social media health communication, the role of Twitter/X in crisis response, and the impact of such communication on disease control outcomes.

The findings of the study indicated that Twitter/X played a significant role in raising awareness about disease outbreaks, disseminating public health messages, and facilitating public engagement in disease control efforts in Kampala. Respondents reported that Twitter/X allowed for real-time updates on disease statistics, prevention measures, and government responses to health crises. Social media was also identified as a platform that enabled citizens to share personal experiences, seek information, and hold authorities accountable for public health responses. However, challenges such as misinformation, limited digital literacy, and the lack of coordinated efforts between public health agencies and social media influencers were noted as barriers to the effectiveness of social media in controlling diseases.

Findings

Objective 1: To assess the role of Twitter/X in disseminating accurate information during disease outbreaks in Kampala, Uganda.

The data collected in this study indicates that Twitter/X plays a significant role in disseminating information during disease outbreaks in Kampala, Uganda. The following table summarizes the responses to the survey regarding the use of Twitter/X as a source of information and the perceived accuracy of the information during disease outbreaks.

Survey Findings for Objective 1:

Question	Mean	Standard Deviation
Do you use Twitter/X as a source of information during disease outbreaks?	4.3	0.9
How accurate do you perceive the information on Twitter/X during disease outbreaks?	3.7	1.2
Grand Total	**4.0**	**1.05**

The first row indicates that the majority of respondents (75%) strongly agree with the idea of Twitter/X being a primary source of information during disease outbreaks, with

a mean score of 4.3 and a relatively low standard deviation of 0.9, indicating consensus among the respondents. However, the second question reveals a more moderate perception of the accuracy of the information shared, with a mean score of 3.7 and a higher standard deviation of 1.2, suggesting a more varied response among participants.

In-depth interviews with health professionals, government officials, and social media experts were conducted to explore the role of Twitter/X in disseminating information during disease outbreaks in Kampala, Uganda. The findings revealed that while Twitter/X is widely used as a platform for information dissemination, there are mixed opinions about the accuracy and credibility of the information shared.

Interviewees consistently reported that Twitter/X is a key source of information for the public during disease outbreaks. Government officials noted that the platform provides real-time updates that are essential for public awareness. A health professional emphasized the importance of Twitter/X in reaching younger, tech-savvy audiences who are more likely to engage with health messages online.

Despite the widespread use of Twitter/X, interviewees raised concerns about the accuracy of the information shared. One interviewee, a social media expert, stated that "while Twitter/X helps spread information quickly, it is not always accurate or well-vetted," and highlighted the challenge of misinformation and rumors being spread by users. Government officials acknowledged that while official accounts share verified information, it is often difficult to control or monitor all user-generated content.

Several interviewees pointed out that although government and health authorities use Twitter/X to disseminate key health messages, their presence is not as dominant as non-official accounts. One health expert stated, "Sometimes, health authorities are slower to respond on Twitter, and this leaves a gap that is often filled with misinformation."

The interview findings revealed that Twitter/X is a crucial tool for disseminating information, especially during disease outbreaks. Health professionals and government officials noted the platform's ability to reach large audiences quickly, enabling the rapid distribution of vital health messages. However, the concerns regarding the accuracy and credibility of information shared on Twitter/X highlight the challenges discussed in the literature. According to Perrin & Duggan (2015), social media platforms like Twitter have the ability to rapidly spread information, but they also create an environment in which misinformation can thrive. This is consistent with the interview findings, where respondents acknowledged that while official accounts provide accurate and reliable information, user-generated content often clouds the communication process.

In line with Framing Theory, the literature suggests that how information is framed can significantly impact the public's interpretation of that information (Entman, 1993). The findings in this study support this claim. Official health organizations or government accounts often frame their messages in a clear, direct manner, but user-generated content may frame disease information differently, potentially distorting the health message. This distortion can confuse the public, making it harder for individuals to discern accurate information from misleading posts. Grootendorst et al. (2017) argue that the framing of health-related information on

social media influences how the public understands health risks and behaviors, a pattern evident in the findings of this study.

Additionally, Kwak et al. (2010) highlighted that government and health organizations have begun using social media as a way to push out information during crises. The interviews also confirm this, with health officials noting that while they use Twitter/X for official communication, their presence is not as dominant as unofficial sources. This reflects the challenge discussed in the literature about the limited influence of official accounts compared to the vast array of user-generated content on platforms like Twitter/X.

Framing Theory suggests that the way information is presented or "framed" influences the way people interpret it (Entman, 1993). In the context of Twitter/X, the way health messages are framed by official health authorities can either enhance or detract from their perceived accuracy. For example, the government and health authorities may use Twitter/X to present clear, factual information about disease outbreaks, but the framing of this information by non-official users (through posts, retweets, and hashtags) can distort its original message. The study found that while official accounts play a role in providing reliable information, the framing of the message by individual users can lead to confusion or misinterpretation, which aligns with Framing Theory's assertion that media shapes the way information is understood by the public.

Social Cognitive Theory highlights the role of media in shaping behavior through observational learning. In the case of Twitter/X, the dissemination of health information through the platform can influence users' health-related behaviors by providing them with models of correct actions (e.g., following preventive measures during outbreaks). The findings suggest that Twitter/X can be an effective platform for disseminating information, especially when government and health authorities use it to model appropriate behaviors, such as getting vaccinated or adhering to health guidelines.

Objective 2: To determine the impact of misinformation on public health behavior during disease outbreaks in Kampala, Uganda.

The second objective of the study aimed to evaluate the impact of misinformation on public health behavior. The survey data suggests that misinformation is prevalent on Twitter/X, and it does influence individuals' decisions on health measures such as vaccination, social distancing, and treatment adherence.

Survey Findings for Objective 2:

Question	Mean	Standard Deviation
How often do you encounter misinformation on Twitter/X during disease outbreaks?	3.4	1.1
To what extent does misinformation on Twitter/X affect your health behavior?	3.2	1.3
Grand Total	**3.3**	**1.2**

From the table, it is evident that respondents frequently encounter misinformation on Twitter/X during disease outbreaks, with a mean score of 3.4. The standard deviation of 1.1 indicates a fairly consistent experience of misinformation, although there were some variations. Additionally, the second question on how misinformation affects behavior showed a mean score of 3.2, suggesting that misinformation has a moderate effect on public health decisions. The higher standard deviation (1.3) reveals variability in the extent of this influence among respondents.

Objective 2: To determine the impact of misinformation on public health behavior during disease outbreaks in Kampala, Uganda.

In exploring the second objective, interviewees discussed the role of misinformation on Twitter/X and its influence on public health behaviors, such as vaccination, social distancing, and treatment adherence.

All interviewees agreed that misinformation is a significant challenge on Twitter/X. Social media experts noted that the ease of posting and the rapid spread of information without fact-checking contributes to the spread of false or misleading content. One government official noted, "During the Ebola outbreak, there were many unfounded rumors about the cause of the disease, which created confusion among the public."

The interviews revealed that misinformation on Twitter/X often leads to negative public health behaviors. For example, one health professional highlighted the role of false claims regarding vaccine safety, which discouraged some individuals from getting vaccinated. Similarly, government officials noted that misinformation related to treatment options and disease prevention protocols contributed to non-compliance with health guidelines.

Several interviewees emphasized the importance of public education and media literacy to counter misinformation. A government representative noted, "We need to be proactive in sharing correct information, and we need to engage with the public to ensure they understand what is true and what isn't."

The findings from the interviews show a strong concern regarding the prevalence of misinformation on Twitter/X and its impact on public health behavior. The interviewees indicated that misinformation has led to confusion and, in some cases, reluctance to follow preventive health measures, such as vaccination or social distancing. These findings resonate with the work of Vosoughi et al. (2018), who found that misinformation spreads much faster on social media than true information, especially during public health crises. The spread of false claims on Twitter/X during outbreaks often creates confusion, which negatively impacts individuals' health behavior, as observed in this study.

Framing Theory again proves useful in understanding how misinformation can lead to harmful health behaviors. Misinformation is often framed in a way that sounds authoritative or emotionally charged, such as false claims about the safety of vaccines or misleading information about disease prevention methods. According to Scheufele (1999), the framing of messages can influence public attitudes and behaviors by highlighting certain aspects of an issue while downplaying others. For example, misinformation about vaccine safety, when framed as a concern or threat, can lead individuals to avoid vaccination, thus hindering disease control efforts. This was

reflected in the interview findings, where one health professional discussed how rumors about vaccine side effects led to vaccine hesitancy.

Social Cognitive Theory provides additional insight into the findings related to the influence of misinformation. According to Bandura (2004), individuals learn behaviors by observing the actions and consequences of others, particularly those seen as credible or influential. The spread of misinformation on Twitter/X often occurs through the process of social learning, where individuals share content based on perceived authority or emotional appeal, even if the content is false. The interview findings support this theory, as they showed that people's decisions about health behaviors, such as getting vaccinated or following preventive guidelines, are influenced by the misleading content they encounter online.

Moreover, the findings are consistent with Fraser et al. (2012), who argue that misinformation on social media can significantly disrupt public health campaigns by causing individuals to disregard valid health advice. The interviewees noted that misinformation on Twitter/X led people to question the credibility of health guidelines, with some choosing to ignore official advice in favor of rumors and unverified claims. This demonstrates the powerful role of social media in shaping behavior, as highlighted in Social Cognitive Theory, where individuals often model their actions based on what they see online.

The impact of misinformation can be understood through Social Cognitive Theory in terms of how people model unhealthy behaviors based on what they see on social media. For example, seeing posts that downplay the severity of an outbreak or spread misinformation about vaccine safety may lead individuals to imitate those behaviors and disregard health guidelines. The interview findings suggest that misinformation on Twitter/X has a significant influence on public health behaviors, demonstrating the role of social media in shaping behaviors through modeling and observational learning.

Objective 3: To evaluate the effectiveness of Twitter/X in mobilizing the public for disease prevention and control efforts in Kampala, Uganda.

This objective aimed to assess how effectively Twitter/X has been used to mobilize the public for disease prevention and control during outbreaks in Kampala. The survey focused on how Twitter/X was utilized to encourage participation in health measures such as vaccination, wearing masks, and social distancing.

Question	**Mean**	**Standard Deviation**
Do you think Twitter/X has been effective in mobilizing people to participate in disease prevention efforts?	4.1	0.8
Has Twitter/X been helpful in encouraging you to take preventive actions during disease outbreaks (e.g., vaccination, wearing masks)?	4.0	0.9
Grand Total	**4.05**	**0.85**

The findings from the survey indicate that Twitter/X is seen as highly effective in mobilizing the public for disease prevention efforts. The first question, which asked about the general effectiveness of Twitter/X in encouraging public participation, had a mean score of 4.1 and a standard deviation of 0.8. This suggests a general consensus that the platform has been successful in encouraging participation. In addition, the second question about the specific influence of Twitter/X on individuals' personal actions (such as vaccination and mask-wearing) yielded a mean score of 4.0, further supporting the platform's role in encouraging proactive behavior.

The findings from the interviews highlight a mixed influence of social media on public health behaviors. While respondents acknowledged that social media platforms, especially Twitter/X, have successfully promoted health messages regarding disease control (such as vaccination and preventive health practices), they also pointed out the significant challenges posed by misinformation. The interviewees indicated that Twitter/X encourages some individuals to adopt health guidelines, such as vaccination, through campaigns by trusted health authorities. However, others were influenced by false claims, particularly around vaccine safety and virus transmission, which led them to avoid certain preventive measures.

These findings resonate with Social Cognitive Theory (Bandura, 2004), which emphasizes the role of social influences in behavior change. According to the theory, individuals learn and adopt behaviors based on the actions and outcomes of those they observe, particularly those who they view as credible or influential. The interviews revealed that many individuals followed health advice from government health agencies or medical professionals on Twitter/X, especially when they saw their peers or public figures engaging with the information positively. This highlights the role of observational learning in shaping behavior, as users mimic the health behaviors they see from trusted sources.

However, the influence of misinformation is also a significant concern. In line with Framing Theory (Entman, 1993), the manner in which health information is framed on Twitter/X greatly affects how the public receives and responds to it. Health messages framed positively, with clear, fact-based information from authoritative sources, were found to encourage better public health behaviors. In contrast, misinformation or negative framing of health advice contributed to the public's reluctance to follow guidelines, such as not getting vaccinated or neglecting hygiene practices. This was particularly evident in the findings where respondents pointed out that the spread of misleading health advice from user-generated content often led individuals to adopt unverified and potentially harmful behaviors.

Perrin & Duggan (2015) noted that social media can also create "echo chambers" in which people are exposed only to information that confirms their existing beliefs, which was evident in this study's interviews. Respondents mentioned how individuals within specific social groups, such as anti-vaccine communities, reinforced each other's false beliefs about the safety of vaccines through Twitter/X, making it more difficult for health authorities to counter these claims effectively.

Objective 4: To assess the role of government and health authorities in

leveraging Twitter/X for disease control and public health communication during outbreaks in Kampala, Uganda.

This objective aimed to evaluate the role played by government and health authorities in leveraging Twitter/X to communicate critical health messages and manage disease outbreaks. The survey collected data on the level of involvement of official health authorities in using Twitter/X for public health purposes.

Question	Mean	Standard Deviation
Do you think the government and health authorities effectively use Twitter/X to communicate health information during disease outbreaks?	3.9	1.0
Have you encountered official health messages from government or health organizations on Twitter/X during disease outbreaks?	4.2	0.9
Grand Total	**4.05**	**0.95**

The survey data indicates that respondents believe the government and health authorities effectively use Twitter/X for disease control communication. The first question, which assessed the overall effectiveness of government use of Twitter/X, resulted in a mean score of 3.9, with a standard deviation of 1.0, suggesting that while the majority of respondents view the efforts positively, some still have reservations about the effectiveness of government communication. In contrast, the second question, which focused on the frequency of encountering official health messages, had a mean score of 4.2, reflecting the view that health organizations actively use the platform to disseminate messages during disease outbreaks.

The interview findings for this objective emphasize the importance of engagement strategies by health authorities to overcome misinformation and encourage positive health behaviors. Respondents highlighted that health authorities should not only disseminate information but also engage actively with the public on Twitter/X to foster a two-way communication channel. This engagement includes answering questions, clarifying misconceptions, and providing evidence-based responses to combat misinformation. Health professionals noted that, while Twitter/X is an excellent tool for disseminating messages, active engagement can amplify the effectiveness of the messages in changing public health behaviors.

These findings are consistent with Tufekci (2015), who argues that engagement, rather than just information dissemination, is key to improving the impact of social media on public health outcomes. According to Brossard et al. (2013), the most effective public health campaigns on social media are those that not only provide factual information but also foster meaningful dialogue with the community. The interviews further confirmed this, with many respondents emphasizing that successful campaigns involved frequent interactions between health officials and the public, allowing for the correction of misinformation and the clarification of doubts in real time.

Bandura's (2004) Social Cognitive Theory offers another useful lens for understanding the effectiveness of engagement strategies. According to the theory, individuals are more likely to adopt health behaviors when they see others engaging positively with health messages and receive social reinforcement. In the context of Twitter/X, the active participation of health authorities and respected influencers can shape how users perceive health guidelines. The findings suggested that when public health agencies actively interact with users, not only by posting information but by engaging in conversations, users are more likely to adopt healthier behaviors, such as following hygiene practices or adhering to vaccination schedules.

Furthermore, the interview findings highlighted the need for health authorities to address misinformation promptly and transparently. Vosoughi et al. (2018) found that misinformation spreads faster than accurate information on social media, and this study's interviews similarly revealed that the lack of timely engagement with misinformation allowed false claims to flourish. Effective strategies to counter misinformation included direct refutation by health experts, sharing verifiable evidence, and encouraging public figures and influencers to spread accurate information. These approaches align with Fraser et al. (2012), who argue that combating misinformation requires not just passive information-sharing but active intervention and engagement from credible sources.

The findings from Objectives 3 and 4 underscore the complex and dynamic role of Twitter/X in public health communication, particularly during disease outbreaks. While Twitter/X has the potential to promote positive health behaviors and raise awareness about disease control, its effectiveness is often undermined by misinformation. This aligns with the existing literature, which highlights the dual-edged nature of social media platforms.

By applying Social Cognitive Theory and Framing Theory, the study's findings highlight that social media platforms can influence public health behaviors both positively and negatively. Positive health behaviors are more likely to be adopted when users are exposed to well-framed, credible messages from trusted authorities. However, misinformation can disrupt the adoption of these behaviors, as individuals are swayed by false claims and misleading narratives.

Furthermore, the findings emphasize the importance of proactive engagement strategies by health authorities. Active communication, real-time interaction, and the correction of misinformation are critical to mitigating the negative effects of misinformation and improving the public's response to health guidelines. These strategies should be integral to any public health communication campaign on Twitter/X, as they enable the correction of false information, increase the credibility of health messages, and encourage the adoption of healthier behaviors.

Discussion

This study sought to examine the influence of social media, specifically Twitter/X, on disease control and health behaviors in Kampala, Uganda. The findings from the analysis provide insights into the role of Twitter/X in public health communication and its effectiveness in shaping health behaviors. This discussion connects the study's findings with the research objectives, highlights the practical implications for public health strategies, and

explains the observed trends using relevant theoretical frameworks.

Social Media's Impact on Disease Control in Kampala (Objective 1)

The study found that Twitter/X plays a significant role in the dissemination of health information related to disease control in Kampala. This aligns with global trends where social media is increasingly being used as a platform for health communication. Respondents indicated that Twitter/X helped them access real-time updates about disease outbreaks, prevention strategies, and vaccination campaigns. This finding is consistent with literature suggesting that social media platforms are crucial in promoting public health messages (Pew Research Center, 2018). By reaching a large audience quickly, Twitter/X facilitates the rapid spread of crucial health information, making it an invaluable tool in crisis situations.

However, the study also found that misinformation on Twitter/X has a detrimental impact on disease control efforts. False information about disease transmission and vaccination led some users to adopt harmful practices, such as refusing vaccination or ignoring disease prevention measures. This echoes the concerns raised by Fraser et al. (2012) and Vosoughi et al. (2018), who found that misinformation spreads faster than accurate information on social media, which can hinder disease control efforts. This highlights the need for public health authorities to actively monitor and correct misinformation to ensure effective disease control.

The Role of Twitter/X in Shaping Health Behaviors (Objective 2)

The findings from the study indicate that Twitter/X has a significant influence on public health behaviors, such as vaccination uptake and adherence to disease prevention measures. Many respondents indicated that they followed credible health organizations and experts on Twitter/X, which increased their likelihood of adopting health recommendations. This aligns with Social Cognitive Theory (Bandura, 2004), which posits that individuals are more likely to adopt behaviors they observe in others, especially those they perceive as credible role models. The presence of health experts, government officials, and health organizations on Twitter/X provided a sense of trustworthiness that influenced respondents to take part in health initiatives like vaccination.

On the other hand, the study also found that misinformation on social media had a negative impact on health behaviors. Some respondents, influenced by anti-vaccination content or incorrect disease information, chose not to follow health guidelines. This finding supports the Framing Theory (Entman, 1993), which suggests that the way information is presented on social media whether it is framed positively or negatively shapes how it is perceived and acted upon. Misleading frames, such as portraying vaccines as unsafe or questioning disease transmission methods, can sway public opinion and lead to non-compliance with health measures. Thus, the study indicates that while Twitter/X can encourage positive health behaviors, its ability to do so depends

heavily on the framing of information and the credibility of the sources.

Effectiveness of Engagement Strategies on Twitter/X (Objective 3)

The study also explored the effectiveness of engagement strategies by public health organizations on Twitter/X. Respondents reported that the most effective health campaigns were those that actively engaged with users by answering questions, addressing concerns, and countering misinformation in real-time. This reflects the findings of Tufekci (2015), who emphasized that engagement is essential for effective health communication on social media. Engagement not only increases the visibility of health messages but also builds trust and strengthens the relationship between health authorities and the public.

Furthermore, the study revealed that respondents were more likely to trust health information shared by credible sources, such as well-known health organizations and public figures. This supports Bandura's (2004) Social Cognitive Theory, where individuals are more likely to adopt behaviors if they see them endorsed by figures they trust. The real-time, interactive nature of Twitter/X allows public health officials to provide immediate responses to public concerns, correcting misinformation and guiding users toward accurate health behaviors.

However, some respondents expressed frustration with the lack of consistent engagement from health authorities, which led to skepticism and confusion about disease control measures. This highlights the need for more proactive and sustained engagement by health authorities on Twitter/X. Public health organizations must ensure that they remain active participants in online discussions, responding to queries and providing clarifications to prevent misinformation from spreading.

Impact of Misinformation and the Need for Intervention (Objective 4)

Finally, the study found that misinformation was one of the major challenges in utilizing Twitter/X for effective disease control. Respondents noted that false claims about disease transmission, vaccine safety, and preventive measures were widespread on the platform, leading to confusion and reluctance to follow health guidelines. This finding underscores the need for immediate intervention by health authorities to counter misinformation. As Vosoughi et al. (2018) found, misinformation on social media spreads more rapidly than factual information, which poses a significant challenge for public health campaigns.

The study indicates that effective strategies to counter misinformation include providing fact-based information, collaborating with influencers and credible public figures, and using fact-checking organizations to correct false claims. This finding aligns with the work of Brossard et al. (2013), who emphasized the importance of credible voices in public health communication to reduce the spread of misinformation. Moreover, engaging with users in real-time and addressing concerns directly helps to build trust and prevent misinformation from undermining disease control efforts.

In addition to providing accurate information, the study suggests that public health authorities should consider implementing media literacy programs. These programs could educate the public on

how to critically evaluate health information on social media and identify reliable sources. By empowering individuals to distinguish between credible and false information, public health campaigns can mitigate the impact of misinformation and ensure that health behaviors are based on evidence.

The findings of this study underscore the importance of social media, particularly Twitter/X, in shaping public health behaviors and supporting disease control efforts in Kampala, Uganda. Social media platforms are powerful tools for disseminating health information and engaging with the public in real-time. However, the study also highlights the challenges posed by misinformation, which can undermine public health initiatives. Public health authorities must focus on developing effective engagement strategies that build trust, correct misinformation, and encourage the adoption of healthy behaviors. By leveraging the power of Twitter/X, health organizations can reach a broad audience, improve health literacy, and ultimately contribute to more effective disease control in Kampala.

Conclusion and Recommendations

This study investigated the effect of social media, specifically Twitter/X, on disease control and health behaviors in Kampala, Uganda. The findings demonstrate that social media has a significant impact on public health communication, health behaviors, and disease control. However, the study also revealed several challenges that need to be addressed for Twitter/X to be more effective in promoting public health initiatives. This conclusion synthesizes the findings, discusses the implications of the study, and offers recommendations for improving the role of social media in disease control in Uganda.

Conclusion

The findings of this study underscore the growing influence of social media platforms, especially Twitter/X, in shaping public health behaviors and facilitating the dissemination of health information. Twitter/X is an effective tool for quickly communicating updates about disease outbreaks, prevention strategies, and vaccination campaigns to a large and diverse audience. In Kampala, Twitter/X has become an essential platform for health authorities and organizations to engage with the public, providing real-time information and updates during health crises.

The study revealed that the majority of respondents accessed health-related information through Twitter/X, with many individuals relying on it to stay informed about disease outbreaks and the necessary preventive measures. The platform's speed and broad reach make it an indispensable tool for timely and effective communication. However, the study also highlighted the dangers of misinformation and its detrimental impact on public health efforts. False claims and misleading health information circulating on Twitter/X often lead to confusion and non-compliance with health guidelines, such as vaccination programs and disease prevention measures. This aligns with the findings from previous studies, such as those by Vosoughi et al. (2018), which demonstrated that misinformation on social media spreads faster than accurate information and often results in adverse public health outcomes.

Moreover, the findings suggest that Twitter/X has a significant influence on health behaviors, particularly in terms of vaccination uptake and adherence to preventive health

measures. When health messages are shared by credible sources, such as health organizations or government authorities, they tend to be more accepted by the public. Social Cognitive Theory (Bandura, 2004) helped explain this behavior, as individuals are more likely to adopt health behaviors when they see them endorsed by trusted figures or organizations. The interactive nature of Twitter/X also contributes to the effectiveness of health communication by allowing for real-time responses to public concerns and the provision of clarifications.

However, the study also identified several challenges in using Twitter/X for disease control. The spread of misinformation is perhaps the most significant challenge that hampers the effectiveness of health communication. Despite the efforts of health organizations to provide accurate and timely information, the rapid spread of false claims undermines the public's trust in health guidelines and reduces the likelihood of positive health behaviors. The lack of consistent engagement from public health authorities and the absence of clear strategies to combat misinformation further exacerbate this problem.

Recommendations

Given the challenges identified in this study, the following recommendations are made to improve the effectiveness of social media, particularly Twitter/X, in disease control in Kampala, Uganda:

1) **Strengthening the Monitoring of Misinformation:**
   One of the key findings of this study is the rapid spread of misinformation on Twitter/X. To counter this, it is recommended that health authorities in Kampala actively monitor social media platforms for misinformation and promptly correct false claims. This can be done by setting up dedicated teams within public health organizations to monitor social media discussions related to health issues. These teams should be equipped with the tools and resources to track health-related conversations, identify misinformation, and respond with factual information. Fact-checking organizations can be partnered with to ensure that misleading claims are promptly debunked.
2) **Increasing Engagement with the Public:**
   Engaging with the public in real-time is essential for building trust and ensuring the effective dissemination of accurate health information. The study found that respondents appreciated interactive engagements, such as responding to questions and addressing concerns directly. Therefore, it is recommended that health authorities in Kampala enhance their engagement strategies on Twitter/X by offering live Q&A sessions, responding to public queries, and providing clarifications about health issues. This could be facilitated through Twitter chats, where experts and public health officials interact directly with the public to discuss health matters and address misconceptions.
3) **Partnerships with Influencers and Trusted Figures:**
   The study indicated that health messages are more likely to be trusted when shared by credible sources, such as health organizations, government officials, and public health experts. It is recommended that health authorities collaborate with influential figures, including social media influencers, to promote health messages on Twitter/X. These influencers can help amplify the reach of health campaigns and encourage the adoption of healthy behaviors. By partnering with trusted figures, health authorities can enhance

the credibility of their messages and reduce the impact of misinformation.

4) **Developing Media Literacy Campaigns:** Given the prevalence of misinformation on social media, it is crucial to equip the public with the skills to critically evaluate health information online. Therefore, it is recommended that public health organizations in Kampala launch media literacy campaigns aimed at educating the public about how to identify credible sources of health information and avoid falling victim to misinformation. These campaigns could use Twitter/X itself as a platform to disseminate messages about media literacy, as well as offer tips on recognizing fake news and distinguishing between reliable and unreliable health content.
5) **Increasing Collaboration between Health Authorities and Social Media Platforms:** Public health organizations need to strengthen their collaboration with social media platforms like Twitter/X to promote health messages and ensure the accuracy of health-related information. Social media platforms should take an active role in promoting reliable health information by flagging or removing misleading content related to disease control. Health authorities in Uganda should work closely with social media companies to develop guidelines and protocols for handling health-related content and to ensure that public health messages are prominently featured in users' feeds.
6) **Focusing on Community-Based Social Media Initiatives:** Social media should not only be used for top-down communication from health authorities but also for community-driven initiatives. Health organizations in Kampala can use Twitter/X to facilitate discussions among local communities, allowing individuals to share their experiences, ask questions, and learn from one another. These community-driven initiatives can help build trust in health campaigns and encourage more people to adopt preventive health behaviors. Additionally, user-generated content can be a powerful tool for spreading accurate health messages within local networks.
7) **Evaluation and Continuous Improvement of Social Media Campaigns:** Finally, it is essential to regularly evaluate the effectiveness of social media campaigns aimed at disease control and health behavior change. Health authorities should collect feedback from Twitter/X users to assess the impact of their campaigns and make improvements where necessary. This could involve conducting surveys, analyzing engagement metrics, and monitoring changes in health behaviors over time. By continuously evaluating the impact of social media campaigns, health authorities can ensure that they are meeting the needs of the public and adapting to new challenges in health communication.

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