

Role of Facebook in Covid-19 Crisis Management and Awareness Raising Efforts in Bangladesh: Sentiment And Thematic Analysis

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Abstract

The advent of social media opened up a new window of opportunity for crisis communication. These platforms hold great promise as emergency communication tools. It is essential to understand the potential of these platforms in reaching people during an unknown circumstance like the covid-19 pandemic. This study aims to assess the role of Facebook in COVID-19 awareness-building efforts and its relevance for crisis communication in the public sector of Bangladesh. Posts and comments from the Facebook page of the Directorate General of Health Service (DGHS) were extracted from January 1 to June 8, 2020. Government efforts were classified and categorized by different themes based on the content of the posts made by the DGHS. Citizen response and the effort of the DGHS were evaluated by sentiment analysis on English comments made by Facebook users. The results show that the DGHS actively initiated posts from the first COVID-19 case with a significant increase in citizen engagement over time. Nine significant themes from the content of the DGHS's post were identified, among which Facebook live bulletin (28%) and awareness and preventive measures (26%) were the most prevalent themes. Sentiment analysis found the prevalence of positive sentiment in over 20% of the comments. The findings suggest that the DGHS significantly draws public attention through the active use of its Facebook page. Through an official source, Facebook played a key role in facilitating emergency communication during the pandemic and delivering awareness campaigns on behalf of the government.

Keywords: *Social media; Crisis Communication; Sentiment Analysis; Bangladesh*



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INTRODUCTION

“If anything kills over 10 million people in the next few decades, it’s most likely to be a highly infectious virus rather than a war” - Bill Gates, the co-founder of Microsoft, stated during a YouTube TED talk in April of 2015 (TED, 2015). He pointed out that the world is not ready to stop an epidemic at all. A lot of pieces are missing and these things are a global failure. He added, “this is a serious problem we should be concerned. In fact, we can build a really good response system. We have the benefits of all science and technology – we’ve got cell phone to get information from the public and get information out to them. We have satellite maps where we can see where they are and they are moving. We have advances in biology that should dramatically change the turnaround time to look at a pathogen and be able to make drugs and vaccines that fit for that pathogen. So, we can have tool but those tool needs to be put into an overall global health system and we need preparedness” (TED, 2015).

Four years later, prescient forecast of Bill Gates on TED come true, and the world has been plagued by a catastrophic viral pandemic known as coronavirus (or Covid-19). This new disease quickly spread throughout Europe and then around the world, prompting the World Health Organization (WHO) to issue a pandemic alert in March 2020 (Checchi et al., 2021; Liu et al., 2020). It is a novel virus that causes an acute respiratory syndrome characterized by asymptomatic but potentially deadly interstitial bilateral pneumonia and is very contagious, particularly by airborne transmission (Checchi et al., 2021).

Following a rise in the number of reported cases, each country after another imposed social distancing laws affecting the education system, shops, offices, transportation, and a wide range of other sectors (Gkiotsalitis & Cats, 2021). More than half of the world's population was socially isolated, with more than 90 nations in lockdown to combat the COVID-19 outbreak (Di Domenico et al., 2020). Scientists warn that the R_0 or reproductive number of COVID-19 is exceptionally high to reach any age group quickly (Liu et al., 2020). On June 27, 2022, the virus had infected an estimated 539 million people worldwide, with around 6 million fatalities and constant mutation in the form of new variants such as delta and omicron (WHO, 2022). Most nations have begun to report infections by the second half of January 2020. The United States reported the first incidence on January 20, 2020, whereas England, as part of the United Kingdom, recorded its first case on January 31, 2020. The first instance in Singapore was reported on January 23, 2020 (Raamkumar et al., 2020). In Bangladesh, confirmed by the Institute of Epidemiology, Disease Control and Research (IEDCR), the first case of Covid-19 was identified on March 8, 2020. Due to its high population density (about 170 million people in 147,570 km²), inadequate health-care institutions, poverty, and a weak economy, Bangladesh was one of the most vulnerable states (Islam et al., 2020). From the beginning of the outbreak in Bangladesh, the government implemented several COVID-19 prevention measures, including closing schools, colleges, and universities, prohibition of public gatherings, countrywide travel restrictions, and a national holiday (lockdown), among other measures. On March 23, 2020, the government declared nationwide home confinement (public holiday), which lasted until May 27, 2020. Between March and May 2020, the number of COVID-19 cases remained low; however, when the countrywide public holiday was ceased at the end of May 2020 for the sake of people's economic survival, the number of reported cases soared sharply between June and August 2020 (Wikipedia, 2021).

In response to COVID-19, the government of Bangladesh, along with the Directorate General of Health Services (DGHS) and the Institute of Epidemiology, Disease Control, and Research (IEDCR), issued a nationwide warning and deployed multiagency public health initiatives in accordance with WHO guidance to combat the pandemic. To completely involve the general citizens in learning and recognizing the gravity of the outbreak, as well as their duties and responsibilities in mitigating the severity, Bangladesh urgently needed an extensive awareness-raising program through mass media, as well as the Internet and social media (Islam et al., 2020). Raising public awareness and maintaining hygienic guidelines was the most fundamental approach to minimizing coronavirus's community transmission or avoiding rapid infection, especially in developing countries where a large number of people cannot bear the minimum standards of healthcare facilities. Realizing the significance of the massive awareness campaign, in addition to traditional mass media, the Bangladesh government has chosen social media platforms such as Facebook as a means of communication in times of pandemic emergency.

The Directorate General of Health Services (DGHS) aggressively communicated critical information about pandemic crises and provided a live bulletin update on its Facebook page. During a pandemic, social media technologies like Facebook can be a powerful tool for spreading health information to the general population. Emerging highly contagious diseases, including COVID-19, most often lead to greater utilization and consumption of media of all kinds by the wider populace for information (Simon et al., 2015; Tsao et al., 2021). Due to the disease's highly contagious nature, reporters and journalists from traditional media like radio, television, and newspapers confront a significant challenge in gathering information from the government and disseminating it throughout Bangladesh. Many news reporters and journalists found positive of COVID-19 while collecting information, resulting in the isolation of the whole production unit (bdnews24, 2020; Dhaka Tribune,

2020). As a result, social media has become the go-to venue for public opinions, perceptions, and attitudes on COVID-19-related events and policy. For governments, organizations, and institutions to distribute critical information to the public, social media has become a critical communication tool. Therefore, social media has a vital role in people's perception of disease exposure and government efforts to reach citizens in time of pandemic emergencies in Bangladesh (Tsao et al., 2021). Hence, it is critical to comprehend how social media technologies contributed as a distinct communication channels during a pandemic.

This study aims to address three research questions about the use of Facebook during covid-19 emergency in Bangladesh. First, how government agency utilised Facebook as an emergency communication tool during the covid-19 pandemic in Bangladesh? Second, what is the role Facebook played in an effort of pandemic awareness building in Bangladesh? Third, Bangladesh has always been threatened by natural disasters as a result of global warming. Natural disasters such as floods, cyclones, and tsunamis force the government to issue nationwide public emergencies every year. They are required to send a message of heightened awareness to the people who live in the most remote parts of the country. So, what is the relevance of adopting Facebook as an official prospective emergency communication tool during an emerging situation in Bangladesh? Based on the review of previous research (Section 2), we present the method of our study (Section 3) and show both quantitative and qualitative results (Section 4). The conclusion describes the role of Facebook in the context of emergency social media use. The outcomes of the study should understand the probable link between the use of Facebook and its role in response to the COVID-19 in Bangladesh.

LITERATURE REVIEW

Social media is defined as a "group of Internet based applications that build on the ideological and technological foundations of Web 2.0, and that allows the creation and exchange of user-generated content" (Kaplan & Haenlein, 2010). Social Media applications are designed to enable users to create, communicate, collaborate and share the process of creating and consuming content. These tools offer a large number of internet users access to an array of user-centric spaces they could populate with user-generated content and an equally broad range of options for connecting these spaces to build virtual social networks (Obar & Wildman, 2015). With more than 2.85 billion monthly active users worldwide, Facebook is the most popular social media network today (Statista, 2021). Other social media networks, including Twitter, YouTube, WhatsApp, Instagram, and Reddit, each have over >300 million active users monthly and are widely distributed (Reuter & Spielhofer, 2017).

The use of social media in emergencies has evolved into its study topic, to the point where the phrase "crisis informatics" is now widely used. It considers emergency response to be part of a broader social system in which information is disseminated via official and public channels and organizations (Reuter & Spielhofer, 2017). Many studies (i.e. Bird et al., 2012; Peary et al., 2012; Simon et al., 2015; Wang & Ye, 2018) have shown that social media can be a powerful tool for crisis management. In a research based on prior disasters and emergencies stricken globally, Simon et al. (2015) observe social media technologies as essential and significant components of crisis management. In emergencies and natural disasters, social media fosters a sense of connectivity by providing access to vital and timely information from both official and non-official sources. The quantity of information transmitted between vulnerable persons and emergency personnel considerably increases when traditional communication methods such as phones are supplemented with social media. In addition, this supplemented communication results in increased situational awareness, which leads to quicker and more informed

judgments and actions (Yin et al., 2015). By distributing information to the public and receiving input from them, social media allows individuals to participate in disaster management. These tools have been used to increase preparedness by providing daily, real-time information to the public, as demonstrated during the 2009H1N1 pandemic (Simon et al., 2015).

Alexander (2014) shows social media can be used as an important technology for natural disaster management. For example, following the March 2011 earthquake and tsunami in Japan, social media helped with public warnings, searching for missing people, and mapping facets of the disaster. Similarly, Bird et al. (2012) surveyed on the use of social media in disaster like floods and the results indicate that most respondents began using the Facebook community groups on the floods to get information about their community and most of the people found the medium an effective means of communicating with family or friends.

Peary et al. (2012) observed that social media is sometimes the only functioning communication method in disasters. In an extensive online questionnaire survey, they found that during the 2011 earthquake and tsunami in Japan, social media was the most reliable source of information. Around 94% of respondents evaluated social media as a highly beneficial tool in an emergency. During emergencies, social media facilitates safety identification, identifying displaced people, providing damage information, providing support for disabled people, volunteer organization, fund-raising, and moral support systems (Peary et al., 2012). Social media data can also be a potential source of public health surveillance. Public health professionals may use social media data to track information, detect possible outbreaks, forecast infection trends, monitor emergencies, and assess disease awareness and responses to official health communications. Fung et al. (2015) summarise the application of social media in public health surveillance into three different stages.

- Epidemiologic monitoring and surveillance – can be used for three specific functions. First, to monitor official information by foreign authorities and domestic accounts. Second, to detect outbreaks information via syndromic surveillance and event-based surveillance. Syndromic surveillance includes detecting symptoms shared by users on social media by either human readers or a computer algorithm for non-public health purposes. Event-based surveillance includes detecting outbreaks via unofficial information or rumours about the new disease on social media, print media, radio, and television. Third, to provide timely estimates and forecasts of disease incidence.
- Situational awareness - to increase situational awareness of humanitarian crises, e.g., typhoons and earthquakes.
- Communication surveillance – to measure public reactions to an outbreak to monitor the general public's awareness and perception on social media. Also, to monitor people's reaction to specific public health messages by measuring health promotion messages or events on social media.

Moreover, attempts to classify the usage pattern of social media have also been made in response to various emergency circumstances and reactions. Reuter & Kaufhold (2018) described four different patterns of communication using social media during emergencies.

- Citizens to Citizens (C2C) – citizens and digital volunteers communicate with each other and become a part of extensive rescue and response work via social media networks.
- Authorities to Citizens (A2C) – authorities use social media as part of their disaster communication endeavours to educate the general public concerning how to mitigate fatalities and respond correctly in an emergency.
- Citizens to Authorities (C2A) – using data mining to analyse citizen-generated content in social media to measure public awareness by crisis response authorities.

- Authorities to Authorities (A2A) - the inter-and intra-organizational collaboration (A2A) of authorities via social media to facilitate organizational awareness and informal processes.

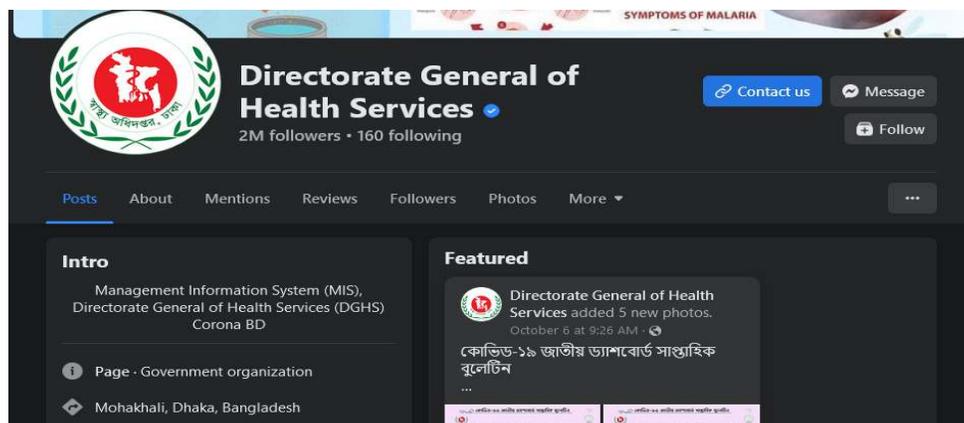
Therefore, social media platforms can be helpful in emergency management efforts by facilitating instantaneous communication with the general public. During crises, government agencies can employ social media networks to disseminate information from official sources. These tools can create new and innovative ways of connecting with citizens during emergencies and raise government responses in crisis management.

However, previous studies on crisis communication through social media in the public institutions was mostly focused on developed countries (Alexander, 2014; Peary et al., 2012; Y. Wang et al., 2021). Additionally, Facebook is the most widely exploited social media site worldwide (Statista, 2021). In contrast to other social media sites its worldwide reach, promptness, and dialogic potential make it ideal for emergency communication in events like COVID-19. Nonetheless, there is a significant literature gap in the use of Facebook as a crisis communication tool, particularly in developing countries. The present study intends to shed the light of existing literature and investigates the role of Facebook in COVID-19 crisis management and awareness building campaign with the reference of Bangladesh.

RESEARCH METHOD

Data Collection

Data were collected from the official Facebook page of the Directorate General of Health Services (DGHS) on 7 June 2022 (https://web.facebook.com/dghsbd?_rdc=1&_rdr). Data from Facebook are acceptable for study since it is extremely rich and valuable. During the Covid-19 pandemic, the DGHS was one of the primary sources of information in Bangladesh. Through their official Facebook channel, the DGHS actively disseminates vital information related to the infection rate, symptoms, fatality, guidelines, and different policy actions from the very beginning. It is one of the agencies of the Ministry of Health & Family Welfare of Bangladesh that implement various health programs, health management, and the development and execution of multiple policies via administration. The Facebook page of the DGHS is verified with more than 2 million followers (See Figure 1).



Source: Author Collected, 2022

Figure 1. Facebook Page of the Directorate General of Health Services

During any pandemic or emergency, information dissemination is not of mere importance. Information from reliable sources is also vital. Facebook has an embraced record of spreading rumours, panic, and misinformation in the previous history. Therefore, information flow from the official Facebook page of the DGHS would have been the best avenue for the government to distribute authentic information to a large fanbase within a short period of time. To meet the requirements of this paper, we collected data in three different phases from the official Facebook page of the DGHS. Phase-I started from 1 January to 7 March 2020 when the Covid-19 pandemic began to spread all over the globe, and this stage will be considered the emergency Preparedness stage for Bangladesh. Phase II started on 8 March, when the first case of Covid-19 was identified in Bangladesh, and ended three months later (8 June 2020) when the nature, precautions, and most of the symptoms were known to the people through rapid information streaming by the government. It will be termed as the pandemic Response stage. From 9 June 2020 to the rest will be considered as the mitigation and Post Pandemic stage (Phase-III) when Covid-19 affected almost all the countries. For the research convenient data only from Phase-I and Phase-II were counted for the study to explore the real scenario concerning pandemic awareness building by the public health department. Thus, overall Facebook activities from 1 January to 8 June 2020 by the DGHS were counted for the study. Throughout this period, all the relevant data, i.e., posts, shares, reactions, comments, and replies, were collected through the Facepager tool. Comments and replies other than this specific time period was filtered out for a better understanding of the study.

Data Analysis

Data analysis was performed through three basic steps. First, collected data was analysed to understand government response in a pandemic emergency. In this case, Post Per Day (PPD) on the DGHS Facebook page was calculated to understand the response rate in a given circumstance. Comparisons of two different stages (Phase-I and II) were also performed to evaluate government efforts to raise public awareness, given that covid-19 is an airborne disease and highly contagious. This step further investigates the efficacy of social media technology to connect citizens in pandemic times by measuring citizen engagement by counting Share Per Post (SPP), Comments Per Post (CPP), and Reactions Per Post (RPP) on the DGHS's Facebook page. Views Per Post (VPP) were also counted in the case of video content.

In the next step, the underlying subject of each COVID-19 post was discovered using thematic analysis through NVivo 12. NVivo is a software that enables users to electronically code texts or images in order to synchronize data and build more statistically rich intersections (Oliveira et al., 2013). Analysis began with data cleansing by reviewing and re-reading the retrieved data to identify emergent patterns and themes. Then data were classified and organized into groups or "nodes" based on the theoretical foundation, and research questions were created. For more than one theme on a single post, each was coded into its own theming unit. Finally, NVivo encoded nodes were reviewed and re-read to find meaningful broader patterns of the theme. Following the preliminary study, nine major categories were identified. Detailed coding categories are provided in Table 1.

Table 1. List of themes coded from the textual content of Facebook posts

Label	Sample of Translated Sentence	Frequency
Appreciation	Salute to those of you who are working day and night in the hospitals for the wellbeing of the country and the people	4
Awareness and preventive measure	Avoid coughing and spitting everywhere to prevent coronavirus. Be careful not to panic	77
Disease Information	No evidence has been found so far that the virus can be transmitted from the dead body of a patient infected with Covid-19	5
Emergency Communication Guidelines	In case of emergency, call 333 or 16263 and get health care	66
Facebook Live Bulletin	Online briefing on the latest status of coronavirus	83
Update	First death recorded today by covid-19 infection	22
Public Reassurance	Stay home, we are always at your service	4
Response Initiatives	Many organizations and volunteers have already come forward to tackle covid-19	15
Others	Are you aware of the prevention of dengue and chikungunya?	16

Source: Processed by Researcher (2022)

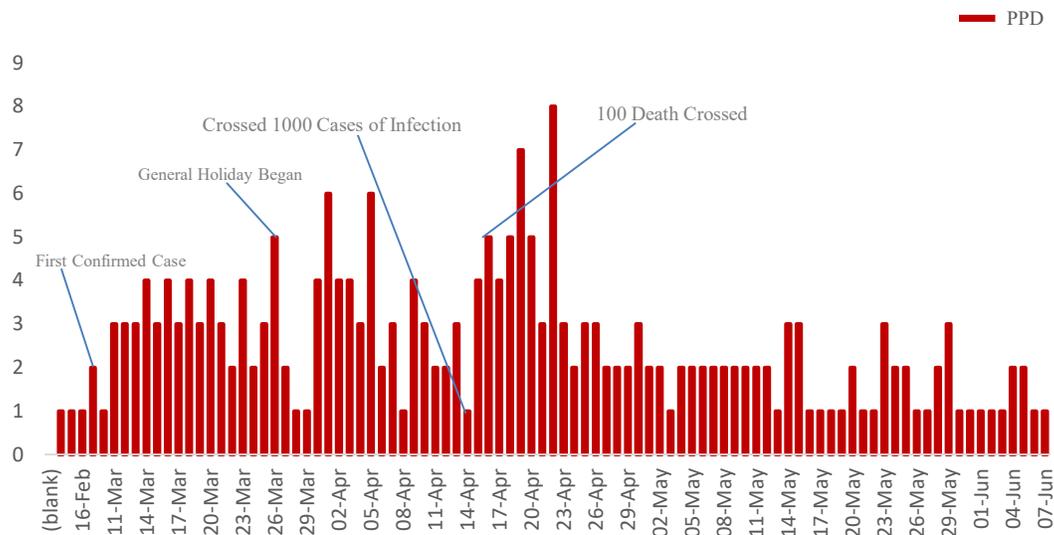
Finally, sentiment analysis of users' comments written in the English language was conducted to understand initial responses and emotions expressed by the citizen on the DGHS's Facebook posts. A total of 2019 (27.29 per post) comments from March 08 to April 08, 2020, were selected through simple random sampling and screened to remove unnecessary words, characters, emojis, URLs, white spaces, etc. Data processing started with tokenization and removal of stop words. Tokenization is a way of breaking chunks of data into an individual group of words to make sure proper execution of text mining application and stop words are those which carry very little helpful information or polarity of sentences (such as a, the, is, are etc). For sentiment analysis *syuzhet* package (Jockers, 2017) is considered as the most popular and efficient package of R. Also, 'Bing', 'Afinn' and 'NRC' dictionaries are widely accepted approach of sentiment analysis (Jockers, 2017). NRC lexicon is amongst the most extensive dictionaries for sentiment analysis (Mohammad & Turney, 2010). With the help of *syuzhet* the sentiment analysis of this study was performed using the NRC (National Research Council) lexicon resources of R. Additionally, the *wordcloud* package of R was applied to justify the most frequent word linked with each sentiment group of user's comments. The entire analysis was performed through the RStudio windows version of 2022.02.3+492.

RESULTS

Government Responses

Figure 2 shows that from January 01 to March 07, 2020, there were only three posts made by the public health department. During this period, the usage statistics of the Facebook page were deficient as a pandemic preparedness stage. From March 08, when the first case was confirmed, the DGHS began to accelerate their presence on its Facebook page and produced at least 1 Covid-19 related post every day. From March 08 to 31, the DGHS made overall 66 posts on an average of 2.21 posts per day (see Table 02). The highest amount of posts published in a single day was six on March 26, 2020. The day government-imposed movement restriction declaring a public holiday throughout the country. Also, the study finds an increase in Facebook usage in the following month of April by the agency. The DGHS made an average of 3.6 posts per day (108 posts) throughout April. On April 14, the number of infection cases crossed 1000 for the first time and showed the sign of community transmission within the country. Right after then, the average post per day peaked at 5 in the next ten days. The highest number of posts in that month was 8, created on April 22.

However, the average post in the next month (May) significantly dropped to 1.77 with a total post of 55. At the beginning of the month, the DGHS seemed to create two posts per day related to Covid-19. The trend continues to fall at the end of the month with an average of 1.1 PPD. Thus, the finding shows government responses, representing the high intensity of initiating posts about COVID-19 on Facebook in the first period of the first case to its peak in the second phase of April.



Source: Processed by Researcher (2022)

Figure 2. Post Per Day (PPD) on the DGHS Facebook page between 08 March to 07 June, 2020

Citizen Engagement

Table 2 indicates that the DGHS seeks a high range of citizen engagement on their Facebook page in the post related to Covid-19. From January 01 to February 29, the highest number of citizen

engagement was extremely poor, with being average RPP of 370. However, the average RPP during March was 3,987.51, following a considerable increase for the rest of the given period. For instance, the average RPP in April and May increased more than four and 10-fold, respectively, that of the March period. The highest average RPP was 43,321.1 during May. Similarly, CPP follows a sharp increase throughout the second phase, and vice versa – the average CPP of March increased 14 times during May being the highest at 1090.236.

The number of shares made to individual content published on organizations' Facebook pages is another metric of Facebook engagement (Jukić & Merlak, 2017). In that case, the average SPP in the march were 1847.62, which increased to 2954.96 during April. However, the trend falls to 1965.8 during May on average. Perhaps it is due to a decrease in initiating posts during May, providing the followers with less scope to share.

Table 2. Facebook usage trend and citizen engagement on the DGHS Facebook page

Month	PPD	RPP	SPP	CPP
January	0.66	370	365.5	9.5
February	0.32	43	2	0
March	2.21	3,987.51	1,847.62	76.66
April	3.6	15,191.54	2,954.96	207.08
May	1.77	43,321.65	1,965.8	1,090.236

Source: Processed by Researcher (2022)

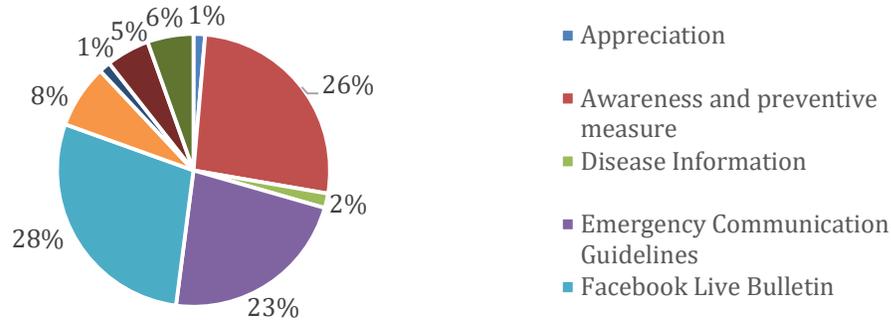
Considering engagement trend, the result shows that citizen engagement began to increase unpredictably on the DGHS's Facebook page from the beginning of March. At the pandemic preparedness stage, the DGHS's activities on the Facebook page were minimal; thus, citizen engagement was very low. Since the first case of Covid-19, the DGHS began to utilise their Facebook platform following an unheard amount of citizen engagement on their Facebook post. The trends continue to grow throughout the first wave. Even though the DGHS significantly dropped their Facebook responses in May, citizen engagement continues to grow multiple times faster than in previous months. It may indicate a persistent tendency to connect with the DGHS, which is considered a valuable source of pandemic emergency information by the Facebook page followers. The higher the number of fans, the higher the government response, the higher the reach and the higher the potential for engagement.

Thematic Analysis

Thematic analysis of the post on the DGHS Facebook page was dispersed diversely. As shown in Figure 03, around eight types of themes were identified on the posts related to Covid-19. Facebook live bulletin was the highest frequent theme (28%). The DGHS was found to be outreaching Covid-19 information by the live streaming feature of Facebook regularly. Each live streaming post was entitled with a virtual health bulletin of the health department on the Covid-19 situation. The DGHS disseminated information about daily infection cases, situation updates, testing capacity, symptoms, and death per day on these live streaming.

The study finds a considerable number of viewers of those live feeds on Facebook. Moreover, the following highest frequent theme topic was found to be awareness and preventive measures (26%). From the very beginning, the DGHS seems actively creating posts related to maintaining social distancing, staying home, washing hands with sanitizer, and so on through textual and video content. On the other hand, around 23% of the content addressed communication issues regarding the Covid-19

emergency. Many posts suggest an emergency communication system providing phone numbers, email, and other active internet-based communication platforms.



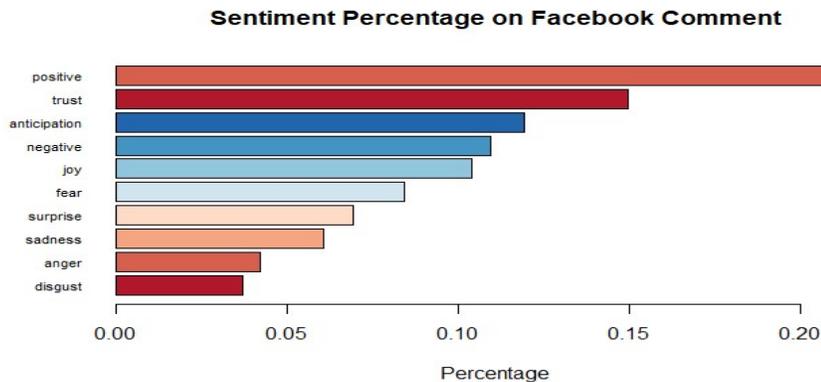
Source: Processed by Researcher (2022)

Figure 3. Thematic Analysis of the Post Made by the DGHS on Facebook Page During March 08 to May 31

Additionally, the theme related to situation update as textual content rather than live feed was incorporated in around 8% of the posts. Also, the study noted a few extant (less than 5%) other themes related to Covid-19 (i.e., appreciation, disease information, public reassurance, responsive initiative, etc.). Around 6% of the total post was found to be other than the topic of Covid-19.

Sentiment Analysis

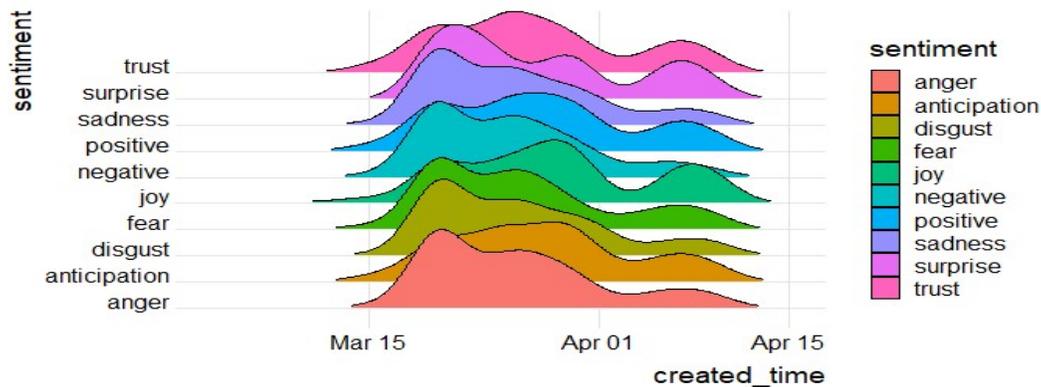
Sentiment analysis using the NRC sentiment lexicon allows us to express each document as comprising eight basic emotions: anger, anticipation, disgust, fear, joy, sadness, surprise, trust and two sentiments: positive and negative. The results of applying this sentiment analysis to comments on the DGHS's COVID19 related posts on Facebook during the first 31 days are displayed in Figure 4.



Source: Processed by Researcher (2022)

Figure 4. Bar Plot showing the count of words associated with each sentiment group expressed as a percentage

Positivity was the dominant sentiment exhibited in the posts, making up over 20% of the emotions carrying words. On the other hand, negative sentiment contributed only 12% of the comments. It signifies that the DGHS had a positive outlook during pandemic outreach efforts. Moreover, it is worth noting that trust emotion exceeds negative sentiment, indicating that the DGHS is gaining public credibility as an official source of covid-19 information. Among eight emotions, trust was the prevalent emotion being 15.8% words from the comments. Anticipation and sadness were the following emotions categories associated with around 10% of the comments, respectively. Negative emotions such as fear, disgust, and anger were expressed in many comments, accounting for 8.5%, 8%, and 3.5% of words, respectively. Emotions such as joy were 8%, and surprise was 5% of the comments.



Source: Processed by Researcher (2022)

Figure 5. Plot depicting the variation in emotions and sentiments carrying words for each sentiment group over the first 31 days of the COVID-19 timeline

Figure 5 expresses surprise, sadness, negative, fear, disgust, and anger contain a steep curve in the mid of march, which follows declining for the rest of the time. It may happen due to an increased number of cases, fatalities, and initiation of Facebook posts in the mid of march by the DGHS. From the beginning of April, joy, surprise and trust have seen a sharp increase in positive emotion in comments. As government initiatives and more information on COVID-19 became accessible, the public's favourable feelings took centre stage.

Skunkan's (2020) view that social media in many countries has been extensively used as a public communication tool to learn about the COVID-19 pandemic.

Citizen engagement on the DGHS's Facebook post was extremely high. At the beginning phase of Covid-19 in Bangladesh, the nature and trend were unknown to people; thus, they were looking for information from different sources. As the DGHS started utilising their Facebook platform frequently, citizens engagement increased rapidly and continued to grow throughout the rest of the period. As a result, it can be concluded that the DGHS's built a large audience base on its Facebook page to get their voices heard during pandemic times and has become a source of authentic information to the public. These findings are comparable with those of Raamkumar et al. (2020) who measures public response of Covid-19 pandemic in Facebook and found a significance rise in the engagement metric resulted the Covid-19 pandemic.

The thematic analysis indicates the prevalence of awareness and preventive measures and live bulletin to the posts created by the public health department. They actively broadcast live information about daily infection and fatality cases, danger zone, transmission rates, and test kits capacity through daily live bulleting situation updates on their Facebook page. Many famous actors, celebrities, and politicians were also found to educate citizens through video content heading the public awareness campaign against Covid-19. The DGHS was found to be stressing the safety concern of the citizen and disseminating the awareness information like washing hands, wearing masks, staying home, and maintaining social distancing on their Facebook page. This is consistent with the research by Baye (2020) and Güner et al. (2020) both of which found social distancing, frequent hand wash, sanitization etc. is the required approach to prevent COVID-19 infection. They perceived most effective weapon that society has against this virus is the prevention of its spread.

The theme related to the emergency communication guidelines was also sufficient. Many posts were found to be addressing the communication guideline in case of emergencies during pandemic times, providing contact addresses, mobile/telephone numbers, active communication portals etc. These findings are comparable with the research of Malik et al. (2021) who discovered that social media platform can be an effective tool for health organizations to convey their guidelines during crisis communication.

Eventually, from the thematic analysis, the DGHS seem utilised their Facebook page to disseminate pandemic information, where the messages were primarily focused on public awareness, situation updates, emergency communication, and preventive measures. This is in line with the research of Raamkumar et al. (2020). However, the study finds a lack of diversity in the content types of the post. Most of the content was found to be video content in type. The content related to audio, picture and text was comparatively low; also, given that the Covid-19 is highly infectious and an airborne disease in nature, it is crucial to understand how Covid-19 works, the symptoms, and how contagious it is as an airborne disease. A central theme related to the disease information was substantially low in the form of textual content on the posts.

Sentiment analysis enhanced the findings by identifying negative and positive topics on COVID-19. It shows a high range of positive sentiment and emotions in the comment section made by the followers on posts related to Covid-19. With the help of word cloud, the study corroborated sentiment analysis that the citizen felt glad for getting information in time from the DGHS's Facebook page and feeling sad about getting the situation worse every day. Also, the level of trust emotions was relatively high, which suggests that DGHS's Facebook page is an authentic source of information. Trust is essential for the

implementation of a wide range of public policies that rely on public responses. According to Cooper et al. (2008) public institutions with a higher level of public trust can govern effectively.

CONCLUSION

In short, rapid information dissemination is critical in an emerging situation. The government worldwide has been widely adopting the social media platform to facilitate public communication. It is essential to understand the possibility of these platforms reaching people during an unknown circumstance like the covid-19 pandemic. The findings of this study demonstrate the potential of Facebook as a formal setting for reaching people in situations like panic, fear and demanding. Primarily to connect with the citizens where they can reach representatives instantly at a lower cost. Facebook has a great promise to enhance citizen engagement and raise public awareness in a short time as a prospective emergency communication platform.

Given how widely used Facebook is in Bangladesh, it is highly likely that this social media network would prove to be an effective means of communication during emergencies. Since the technology and innovation is becoming the next big thing, Bangladesh must be prepared to fully harness the potential of such platforms in order to mitigate consequences before another wave of unforeseen circumstances strikes. There is a strong need for proper plan and policies regarding social media use in public institutions for an effective and interactive communication medium in emergencies. Using the insights gained from this study and discovering the power of social media, policymakers and relevant organizations can choose which areas to emphasize to mitigate the implications of an emergent situation. Future studies should focus on developing a legal framework regarding the social media consumption in public institutions having a pre-planned approach to deal with unknown circumstances avoiding ethical dilemma of rapid and appropriate information sharing to acquire massive public awareness.

LIMITATION & FURTHER RESEARCH

The study contains some limitations. First, the data were collected from the DGHS's Facebook page only. Other government agencies may utilize social media platform to disseminate Covid-19 information along with the DGHS. So, it's conceivable that this study's findings do not generalise the social media outreach efforts taken during the COVID-19 outbreak. The fact that the study was only conducted using comments written in English is another drawback of the research. Due to the large number of comments written in languages other than English, it might be helpful to do research that takes into account all of the languages in analysis and does so in an in-depth means. Moreover, young people use social media more often than older people, who still use traditional mass media in a variety of ways. This means that COVID-19 communication can be judged by how it affects other channels of behaviour or practice. Hence, Additional research is needed to determine the relative impact of traditional media and social media, with the goal of conducting an in-depth investigation into widespread public awareness across a wide range of demographics.

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