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Social Media for COVID-19 Era Information Collection, and Dissemination: A Case Study of Three Tertiary Hospitals in Ghana

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Abstract

The emergence of digital media platforms like social media has considerably influenced health information collection and dissemination. Through in-depth interviews and purposive sampling, data was solicited from (N=27) frontline health professionals, and public relations officers from Korle Bu Teaching Hospital (Greater Accra Region); Komfo Anokye Teaching Hospital (Ashanti Region) and Tamale Teaching Hospital (Northern Region) to evaluate the effectiveness of social media for COVID-19 information collection and dissemination in Ghana. The participants sampled for the study include; regional public relations officers(n=2); district public relations officers(n=10); COVID-19 contact tracers (n=10) and regional public health officers (n=5). The responses from the participants were analyzed using the qualitative condensed thematic approach. The findings of the study show that social media for public health information facilitates the retrieval of official information, disease detection, timely estimation, and prediction of disease incidence and severity. The predominant social media platforms for COVID-19 information collection and dissemination were, WhatsApp, Facebook, and X (Twitter). On the types of digital content mostly used for dissemination of COVID-19-related information, the findings identified text (such as news releases & blog posts), videos, photos, digital flyers, and podcasts. Regarding the constraints facing health professionals' use of social media for COVID-19 public health information collection, this study identified the high cost of internet data and smartphones, and low budgetary allocation as the three critical limitations. Other challenges are fake news in the form of misinformation, and disinformation on social media platforms. The study recommends an increase in budgetary allocation and required infrastructural development, to enhance the application of social media in public health information collection and dissemination for public health management.

Keywords: *digital media*; *social media; health information; COVID-19; Ghana*

1. Introduction

Media channels adopted for public health communication in Ghana have established that most Ghanaians prefer the more traditional, less mass-oriented channels of communication, this study supports a different investigation carried out to establish the significance of traditional media as an essential medium of communication (Kwame, 2021; Preko, & Boateng, 2020). Traditional media can be described as media that utilize communication channels that are already established to facilitate the discussion of pertinent issues, such as general health education. Because this communication form is integrated within the culture of a given community, Bannor, et al. (2017); Ansu-Kyeremeh et al. (2016) argue that it enhances not only the audiences' beliefs but also their trust in the media of communication, thereby increasing the possibility of media's effectiveness.

Varied studies were carried out to help establish the most effective communication media to reach the people of Ghana in times of public health emergencies via social media platforms. A study conducted by Bannor et al. (2017) investigated how social media utilization to carry out public information collection on vitamin treatment for pregnant women within Ghanaian villages, a great part of the outcomes of the study established those social media platforms are very effective for communicating with rural dwellers of Ghana. Another study by Ansu-Kyeremeh et al. (2016), established that radio stations were the most effective channel of communication for communicating public health information in Ghana. Besides, the radio, posters, and social marketing strategies like billboards and public places announcements (like in churches, mosques, and markets) were also popular and could act as effective media for public health communication as compared to televisions, newspapers, movies, videos, healthcare personnel, and community groups.

However, since the emergence of the COVID-19 pandemic in Ghana, the utilization of social media such as WhatsApp, Facebook, Twitter, YouTube, blogs, and wikis to facilitate health communication, public healthcare information collection, dissemination, and health promotions has progressively increased since the emergence of the for COVID-19 global public health emergency (Aryeetey et al., 2020). This increase has been partly attributed to the ability of social media to eradicate physical barriers that have traditionally hampered access to essential healthcare support (Aryeetey et al., 2020). Bannor et al. (2017) state that social media use hosts various opportunities for users to share strategic health-related information on popularly-used social media platforms, including WhatsApp, Facebook, Twitter, YouTube, blogs, and wikis through different methods that may include texts, images, and short videos. Moreover, the latest analytic developments have improved the capability of health researchers and other health experts to not only compute and analyze metrics that assess the social media implementation process but also any other health-related effects and outcomes related to its application in managing a pandemic like COVID-19.

Consequently, new collaborative methods of evaluation are being used to enhance social media integration within health-related emergencies. Health professionals need to establish what the general public is commenting on most on the various social media platforms and subsequently align their messages to the audiences' needs (Demuyakor, 2020; Khamis, & Geng, 2021). Again, Bannor et al. (2017) also argue that an engagement with the community and its major influencers improves the

credibility of health organizations, and health professionals, besides being an important means of establishing a mutually helpful relationship that may extend beyond the social media realm. Bannor et al. (2017) add that the most favorable action that public health institutions in Ghana need to take is to continue stimulating and engaging in conversation with social media users as well as influencers.

Past studies have confirmed the significance of utilizing social media, effective integrations, and employing the appropriate use of communication media during public health communication (Owusu,2020). The effective integration, the use of appropriate communication media, and direct contact are undoubtedly effective as far as Ghanaian public health communication strategies are concerned**.** Many researchers have conducted studies on the effectiveness of social media for public health communication during the peak of the COVID-19 pandemic. The key findings from these past studies raised key issues such as internet penetration rates, limited access to digital information on health, low usage or bad perceptions of social media platforms, and issues of misinformation and disinformation as the central issues on social media used in health communication. There is however limited literature on the actual effectiveness of these social media platforms for COVID-19-related information collection and dissemination in less-studied developing countries, especially Ghana. Therefore, the effectiveness of social media could be different from the findings of the earlier studies due to the digital divide difference**.** In developing countries like Ghana, where the application of social media in healthcare delivery is limited. The main objective of this study investigate the effectiveness of social media use for health information collection and dissemination during the peak of the COVID-19 pandemic in Ghana.

2. Literature Review

2.1. Predominant social media platforms for collecting COVID-19-related information

Recent studies on the use of social media by health professionals have reported general acceptance and an increase in usage. However, the general acceptance and use of these varied from continent to continent and from country. The underlying differences in the usage of social media by health professionals are premised on different factors. In the developed world, especially the global West and China, the general use of these social media is based on the high levels of digital technologies (Demuyakor, 2020; Khamis, & Geng, 2021). Other studies have also associated the high use of social media in developed countries and continents with internet penetration, low cost of internet bundles, well-regulated online digital space, and robust privacy and safety protocols among others (Kwame, 2021). Other findings on the high demand and use of social media by health professionals in health delivery, especially during the COVID-19 pandemic in advanced countries, conclude that these countries have very robust internet infrastructure, and high digital literacy rates to support the acceptance and use of social media by frontline professionals (Owusu, 2020).

Though much progress has been made in the number of health professionals who use social media in developing countries like Ghana, there are still basic issues regarding usage by health institutions (Aryeetey et al., 2020). In Ghana, the use of social media for health information, especially during the

COVID-19 pandemic is still at the elementary stage. However, during the peak of the COVID-19 pandemic, social media platforms were mostly used for health advocacy, dissemination, and collection of COVID-19-related information. The information disseminated on social media is valuable in increasing the public knowledge of the treatment options and protocols of the pandemic (Owusu, 2020). Among the many social media platforms, WhatsApp, Facebook, Twitter(X), and LinkedIn were the most predominant platforms adopted by health professionals for information collection, sharing, and advocacy. For better communication in crisis times, these social media platforms provide the perfect avenue for increased knowledge, professional networking, information sharing, collection, and empowering the public on the protocols of the COVID-19 pandemic (Preko, and Boateng, 2020). The general concerns on the effectiveness of social for COVID-19-related information collection, demarcating professional, and personal boundaries. The breaches of privacy, confidentiality, and misinformation are some key setbacks associated with the deployment of social media for COVID-19 information collection (Khamis, and Geng, 2021).

Social media such as WhatsApp, Facebook, X (Twitter), YouTube, blogs, and wikis have transformed the world to the extent that, the health sector now uses digital resources for the rapid delivery of essential healthcare services to the general population (Jenssen, et al., 2016). Exploiting these particular resources demands a good understanding of the various factors that the health communication interactions within the social media context. Consequently, identifying the features of healthcare communication that enhance not just user engagement, but also message conveyance is a potential strategy for utilizing social media platforms as an essential tool for health information collection and management (Rashid, and Wang, 2021).

2.2. Social media content type for dissemination of COVID-19-related information

Social media platforms have played a very vital role in health information dissemination during the peak of the COVID-19 public health emergency. Varied information was disseminated on social media platforms such as WhatsApp, Facebook, and X (Twitter) to educate the general public on the outbreak. Key themes like COVID-19 management strategies, awareness creation, behaviourial, and attitudinal change (Kyei-Gyamfi, and Kyei-Gyamfi,2023). Other information on conspiracy theories about the pandemic was also widely shared on various social media accounts. The COVID-19 emergence came with lots of fear, panic, uncertainty, and great volumes of misinformation, and disinformation (Tabong, and Segtub, 2021). To alleviate the fear of the public, frontline health professionals, and public relations units adopted social media platforms to share the right content to influence public opinion on the pandemic. Other key content types shared on the official social media accounts of the health institutions generally focus on creating awareness designed to help reduce, transform, or change behaviors, minimizing morbidity and deaths from various health emergencies (Khoo, 2020).

Content on prevention and treatment compliance and surveillance was also shared via digital formats such as charts, graphs, tables, news, releases, videos, and photos, among others for public consumption on varied social media accounts. During COVID-19, surveillance was based on information-specific activity that is required to collect, analyze, and interpret a huge volume of data,

emanating from various sources. The information collated is applied in several ways to measure or judge the efficacy, and the effectiveness of health measures like control and preventative (Ma, et al.,2020).

Other social media content strategies shared on social media are for advocacy through policymakers, traditional and opinion leaders, chiefs, community leaders, NGOs, and other legacy media outlets. The information shared on the hospital's social media accounts is aimed at educating the general civilian population on the needed interventions for COVID-19 control (Adekunle, and Mohammed, 2022). Again, the social media communication strategy is also aimed at community mobilization. The community mobilization information dissemination is targeted at encouraging various stakeholders at the district and community levels to get involved and roll out COVID-19 sensitization among the population (Antwi-Boasiako and Nyarkoh,2020). The last social media content strategy is the development and use of information, education, and communication materials for COVID-19 control and prevention.

2.3. The positive impact of social media on the collection, and dissemination of COVID-19-related information

WhatsApp, Facebook, Twitter(X), YouTube, blogs, and wikis for COVID-19-related information collection is certainly a key to healthcare delivery, and thus progress in communication technology and digital media holds key prospects in terms of managing public health and other development challenges facing the continent (Whitelaw et al., 2020). Indeed, as highlighted by Mitchell & Kan (2019), such assurance is founded on improving the rate of internet penetration in addition to the intrinsic features of social media technology, which include speed, multimodality, interactivity, mass customization, genuine dialogue, and user-generated content. Other research also emphasizes the significant role of Information Communication Technology (ICT) in revolutionizing healthcare communication practices.

Sridevi and Arunkumar (2017), have contended that social media for health information collection is key to healthcare delivery, and thus progress in communication technology and digital media holds key prospects in terms of managing public health and other development challenges facing the continent Indeed, as highlighted by Mitchell & Kan (2019), such assurance is founded on improving the rate of internet penetration in addition to the intrinsic features of social media technology, which include speed, multimodality, interactivity, mass customization, genuine dialogue, and user-generated content. Other research also emphasizes the significant role of ICT in revolutionizing healthcare communication practices.

Collecting COVID-19-related information on social media is passed to various passive audiences according to a World Health Organization, 2020 report on a draft global strategy for digital health. Health information collection and dissemination is the process involved in getting and keeping quality patient health information. The information may be either paper-based, a combination of paper and digital (hybrid), or as is more often the case, a full health record (WHO, 2020). Indeed, another report by the World Health Organization 2020 on social media among health communication specialists cited that, the fast development of the internet, the increase in digital social interaction, and the dynamic information exchanges within the healthcare communication sector, have now been adopted worldwide.

Internet-dependent applications like WhatsApp, Facebook, Twitter(X), YouTube, blogs, and wikis enable the creation, as well as the sharing of consumer-generated content. According to Anwar et al. (2020), people currently prefer to utilize social media to seek health-related information more often than they engage doctors.

2.4. The potential risks of social media for the collection, and dissemination of COVID-19-related information

Regardless of the global use of social media via the Internet to disseminate COVID-19-related information, Sell, et al. (2020) note that the digital environment also forms a major source of significant misinformation and disinformation. This assertion is endorsed by Swire-Thompson and Lazer (2020) who identified various cases of misinformation as well as the sharing of incorrect health information both nationally and internationally owing to speedy information circulation as well as the enhanced social connectivity witnessed in this digital era. This particular worrying situation is further supported by Wen et al. (2020) who express concern regarding social media's impact on health professionals in their attempt to seek COVID-19-related information. They propose that the use of the internet, as well as social media, may enhance misconceptions regarding COVID-19 vaccines, privacy issues, and trustworthiness, amongst health professionals, is a factor that may draw them into unsuitable platforms as well as content. In general, social media and other digital technologies like WhatsApp, Facebook, Twitter(X), YouTube, blogs, and wikis indeed have great potential as far as transforming general communication health awareness, and education are concerned (Statucki et al., 2020). On the other hand, great caution is required judging from its alleged impact on influencing not only social but also behavior change. Naslund et al. (2017) note that unceasing learning on how to exploit the influence of social media use for public healthcare information collection and dissemination is inevitable.

The reviewed literature above on social media for public health information collection and dissemination has produced varied outcomes and is also very limited. Unfortunately, evidence from reviewed studies remains limited on how health professionals and institutions and professionals can effectively leverage new media technologies like WhatsApp, Facebook, Twitter, YouTube, blogs, and wikis in health communication, especially within the field of public health information collection and dissemination on COVID-19 and other future pandemics. The conditions necessary for the effective implementation of social media in health communication, specific to public health information collection and dissemination on COVID-19, were not wholly addressed by the literature review. Country-specific literature on the best practices for designing, evaluating, and prosecuting robust social media regulations on public health information collection and dissemination in developing countries, especially in Africa is also limited in the reviewed literature. This demonstrates that there is a need to understand the effectiveness of social media platforms for COVID-19-related information collection and dissemination in less-studied regions and countries like Africa and Ghana.

Although it is difficult to isolate social media and traditional media from health communication, since the emergence of the COVID-19 pandemic, the literature on country-specific uses of social media platforms in COVID-19 information collection and dissemination is generally missing or limited. This study,

therefore, gets the opportunity to incorporate directly the effectiveness of the concept of social media in health communication and the role of social media in COVID-19 information collection and dissemination for awareness creation and health behavioral changes. To address these gaps, therefore, this study investigated the effectiveness of social media in COVID-19 public health information collection and dissemination. Based on the study objective, and gaps identified in the literature review, the following research questions are proposed;

RQ1: What are the predominant social media platforms used for the collection and dissemination of COVID-19-related information in Ghana?

RQ2: What social media content type was used to disseminate COVID-19-related information in Ghana?

RQ3: What are the positive impacts of social media on the collection and dissemination of COVID-19 information in Ghana?

RQ4: What specific potential risks were encountered using social media for collection, and dissemination of COVID-19-related information?

3. Materials and Methods

3.1. Research Design

Due to the prior experience of the researchers, in-depth interviews were used by the authors with the help of two research assistants to solicit responses from (N=27) participants. The participants were Regional Public Relations Officers, District Officers of Public Relations Services, COVID-19 Team Leaders/Contact tracers, and Regional Disease Control officer of Ghana Health Service who were responsible for collecting and disseminating COVID-19 information on the varied social media platforms. The semi-structured questions are intended to get information regarding the background of the participants, demographic information, and the general understanding of the participants about the effectiveness of social media for public health information collection and dissemination in Ghana. Since the study was conducted during the peak of the COVID-19 pandemic when the moment was restricted, after informed consent was sought from the participants from Korle Bu Teaching Hospital (Greater Accra Region); Komfo Anokye Teaching Hospital (Ashanti Region) and Tamale Teaching Hospital (Northern Region), an open-ended question guide was developed for a recorded telephone interview with the respondents. The interviews were conducted between March and May 2021. The telephone interviews took the participants about 10 to 12 minutes to complete. The subsections for the interview guide were designed based on the four research questions of the study, which are;

- *Predominant social media platforms used for COVID-19 information collection, and dissemination;*
- *Social media content type was mostly used for the dissemination of COVID-19-related information;*

- *The positive impacts of using social media for collecting and sharing OVID-19 information;*
- *The potential risks of social media for COVID-19 information collection, and dissemination*.

These subsections aimed at helping the researchers to have responses to the general research questions. Creswell and Creswell (2018) suggested that semi-structured questions are meant to get information from the participants on three main issues including participants' opinions on the subject matter, encourage two-way communication, and provide qualitative data to compare to previous and future data. Therefore, the semi-structured questions approach is ideal for a study on social media COVID-19-related information collection and dissemination. Indeed, an in-depth interview provided rich information regarding the entire key questions of the study (Creswell, & Poth, 2018). Based on the gaps in the reviewed literature, the exploratory nature of the research questions as well as the relevance of responses from the respondents, and how the answers received could help guide future studies the researchers designed the coding based on the common themes identified in the responses. After the responses were collected via telephone the researchers adopted the verbatim transcription approach which is the most common form of transcription in qualitative interviews. McGrath et al. (2019) described verbatim transcription as the word-for-word reproduction of verbal data, where the written words are an exact replication of the audio-recorded words. The final analysis was done through the six-step process of condensed or consolidated themes, thus, familiarization, coding, generating themes, reviewing themes, defining and naming themes, and writing up. as proposed by Naeem et al., (2023). Below is the summary of sample size, data collection methods, and sampling techniques reported in Table 1.

Table 1. Sample Size, Data Collection Methods, and Sampling Techniques

In-Depth Interview			
Regional Public Relations Officers	2	In-depth Interview	Purposive Sampling
District Public Relations Officers	10	In-depth Interview	Purposive Sampling
COVID-19 Team Leaders/Contact tracers	10	In-depth Interview	Purposive Sampling
Regional Public Health officers	5	In-depth Interview	Purposive Sampling
Sub-total for In-depth Interviews			**27**

Source: Researchers Constructs, 2021

3.2. Data Analysis

A total of 27 respondents were sampled through purposive, and interviews, making the response rate exactly 90% (27/30) of the study's targeted population. The justification for adopting purposive sampling is to allow the researchers to have much insight into the effectiveness of social media used in crisis communication from a specific perspective of health information collection and dissemination in the

context of social media use during the COVID-19 pandemic in Ghana. Since this study is about social media for public health communication, researchers used purposive sampling to select frontline health professionals and public relations officers who use social media for collecting health information and dissemination. The discussions were held with the health professionals and public relations officers with the help of self-made semi-structured questions which were given to respondents who agreed to take part in the interview before the agreed date. The collected data were coded and thereafter analyzed using the four-step coding manual approach proposed by Saldaña (2013). The final responses were analyzed using the qualitative condensed themes of the interview questions proposed by Tong, et al. (2007); Creswell (2013).

The condensed thematic analysis was chosen for this interview because it provided a systematic way of organizing, analyzing, and describing the data sets. From the foregone, empirical, basis, the researchers adopted in-depth interviews to solicit views of the heads of departments of the Ghana Health Service at the regional and district directorates on the effectiveness of social media for COVID-19 collection, and dissemination in Ghana. The interviews offered the opportunity for the researchers to validate the opinions of frontline health workers and the health seekers at large on the subject matter. The thematic analysis of the in-depth interviews was also done to fill in the gap on the inadequate knowledge of the researchers on a certain phenomenon, like what is currently under study, Creswell (2013) proposed the application of qualitative or inductive research to investigate the unknown. According to Kyngäs (2020), the qualitative approach is employed to examine the theories, concepts, and practices from a different perspective, than what the researchers already know about the subject matter.

For the analysis of the qualitative data, the condensed thematic analysis technique was used for the identification of themes from the data, to find out the semantic meaning of the coded sentences. The condensed thematic analysis also allowed the researchers to conduct an analysis based on relevant and common themes from the coded data (Creswell, 2015). First, for the thematic analysis, all the data is read so many times to enable the researchers to be familiar with the common themes. Secondly, the initial codes were generated for consideration based on research questions. After the generation of initial codes, certain common themes are searched out in the whole data. The themes are read again re-grouped or divided. After grouping the sub-themes, the researchers distributed these themes into major, and minor themes to produce the report. For the final analysis, all 27 responses were condensed or consolidated and analyzed for further reporting based on or under the themes of the interview questions. The condensed thematic analysis also guides the researchers to identify the patterns of themes in the interview data for analysis and interpretation (Creswell, 2015). The final reporting of the findings was done using what Tong, et al., (2007) described as the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist. Table 2 depicts the demographic characteristics of participants.

Table 2. Demographic Characteristics of Respondents

Demographic Characteristic	Value	Percentage
Age (Years)		
45-49	14	(51.9)
50-59	9	(33.3)
60+	4	(14.8)
Gender		
Males	22	(81.4)
Females	5	(18.5)
Health Facility		
Korle Bu Teaching Hospital(Greater Accra Region)	10	(37)
Komfo Anokye Teaching Hospital(Ashanti Region)	10	(37)
Tamale Teaching Hospital(Northern Region)	7	(26)
Occupation		
Focal persons for the COVID-19 control	15	(55.5)
Regional Public Health officers	7	(25.9)
District Public Relations Officers	3	(11.1)
Regional Public Relations Officers	2	(7.4)
Education		
Degree	17	(62.9)
Master's Degree	6	(22.2)
Doctor of Medicine/PhD	4	(14.8)
Working Experience(Years)		
5-9	11	(40.7)
10-14	9	(33.3)
15-20	5	(18.5)
20+	2	(7.4)

4. Findings

The researchers interviewed 27 participants such as regional public relations officers, district officers of public relations services, covid-19 team leaders/contact tracers, and regional public health officers of the Ghana Health Service who agreed to take part in the study. Responses/views of the 27 interviewees on the subject matter are presented in thematic analysis (condensed thematic form);

RQ1: ***Predominantly Social media platforms for the collection and dissemination of COVID-19-related information***

This research question intends to solicit responses from the participants on the predominant social media platform for the effective collection and dissemination of COVID-19-related information. The discussion with the heads of departments revealed that most of the heads used WhatsApp, Facebook, YouTube Twitter(X), blogs, and wikis. From the responses, 17 heads of departments indicated using WhatsApp, and Facebook with one of the above-listed social media types. Below are some condensed responses, and remarks from 17 respondents on the above question;

> […] I believe strongly that, social media platforms in health have significantly influenced positively our attempts to protect the general public against the COVID-19 pandemic[...] Through social media platforms such as WhatsApp, Facebook, Twitter(X), and YouTube, we have been carrying out massive awareness aimed at improving citizens' behavior change […]. The public health information collection and dissemination via social media has given the general public a much-needed understanding of the effects of COVID-19, thereby enhancing public compliance with COVID-19 prevention interventions[...].

> […] For us, WhatsApp and Facebook alone are okay for us to carry our information collection, and dissemination [….] but sometimes when the need arises, we use other social media types like Twitter(X) […] WhatsApp and Facebook have more audience and a greater number of our target population in Ghana, especially the youth, either in a rural or the urban area all have WhatsApp and Facebook accounts […].

In addition, 5 respondents reported using, Twitter(X) either alone or with other social media types. Moreover, 3 respondents said;

> […] We use YouTube for collection and dissemination of COVID-19-related information in their respective districts as well as the region […]

Lastly, 1 respondent indicated using:

> […] As for me, I prefer blogs, and wikis […] which aid me in the collection and dissemination of COVID-19-related information with staff, and the general public on COVID-19 […].

RQ2: *Social media content type used to disseminate COVID-19-related information*

22 out of 27 of the respondents responded to the research question on the contents of COVID-19 shared on the official social media accounts of hospitals in Ghana. According to the responses from the interviews, the respondents alluded to the fact that the digital content type for COVID-19 information on the official accounts of hospitals is considered valuable for the public: Below are some condensed remarks from the respondents;

> […] About 80% of the content of their social media content types are text ie. such as news releases & blog posts, videos, photos, digital flyers, and podcasts. These content types are aimed at educating online audiences on treatment options for COVID-19, knowledge on COVID-19 prevention, awareness of COVID-19 symptoms, knowledge of COVID-19 transmission routes, knowledge of at-risk people, new infections, geographical spread, educational messages to the general public and target groups on the prevention of COVID-19 [….]
>
> Also, our information center on COVID-19 prevention protocols […] example is the wearing nose mask, physical distancing among others… […] other educational information collected and disseminated include mode of transmission, causes, signs, and symptoms, prevention, and updates of the infection; causes of COVID-19, and treatments compliance […].
>
> […] Social media platforms and accounts of the various health institutions and hospitals are used to disseminate information on COVID-19 Vaccines[...] Some of the information and questions we post include, whether the citizens were ready or willing to take the COVID-19 vaccine [....] [……] Several followers of our social media accounts of health institutions, are made up of different age groups, though some say they would take the vaccine immediately, others said they were not willing to take the vaccine […] […] the feedback from our social media platforms indicates that most of the old-age respondents confirmed that they would be able to accept the vaccine but would only do so after some further scientific evidence on the safety and efficacy of the vaccine […].
>
> […] content of COVID-19-related information collected and shared information on using contact tracing apps is posted on our social media accounts […] they were inquired about the GH COVID-19 Tracker app. More health professionals were aware of the GH COVID-19 Tracker app than were aware of the other apps which were not made specifically for Ghana[…] Still, others thought that Ghana-wide app would be better compared to a world-specific one[…] through social media information collection, several health professionals felt that the contact tracing app was better to prevent the spread of the virus and according to them, it would be helpful to be aware of those who were exposed both for themselves and others[…]. It is also assumed that younger people were better placed to benefit due to their nature of going out more compared to elder people […]

In addition to the above, heads of departments of the Ghana Health Service interviewed for this study indicated that:

> [….] Social media is used to circulate COVID-19 preventive messages, among them including wearing facemasks, hand washing, and social distancing. Other contents of messages shared by the heads of departments comprised dissemination of COVID-19 control messages such as causes, symptoms, early detection, and treatments [….]
> [...]using social media to circulate information on the extent of infection and spread of COVID-19 cases in their localities […]

Some of the public health officers further remarked;

> […] For us in this hospital, social media especially Facebook and WhatsApp have greatly helped us to educate our people on the need to use nose masks to avoid contracting COVID-19 […] [….] Social media has helped us a lot to reduce COVID-19 cases in this hospital […].

RQ3: ***Positive impact of social media for COVID-19 information collection and dissemination***

This question aimed to solicit the views of respondents of various health institutions on the positive impact of using social media for COVID-19 public health information collection, and dissemination in Ghana. The thematic condensed responses from all 27 heads of departments acknowledged that all health facilities in Ghana still use social media to conduct massive information collection at the peak of the COVID-19 pandemic has significantly increased the volume of public health information collection, and dissemination by health professionals. Below are some condensed remarks from the respondents;

> "[….] the use of social media had a very positive impact on COVID-19 related information collection, ad dissemination in varied ways [….] Before COVID-19 budgetary allocations from the Central Government for health information collection, and dissemination was very low (…] however, since mid-2020, the surge in COVID-19 cases in Ghana has resulted in the Government has increased funding support for public health information collection on COVID-19(...]
>
> [….] As a result of the high death rates and infectious nature of COVID-19, the government has instructed health facilities to increase their public health awareness and give up-to-date information on COVID-19[...] these directives have resulted in some health institutions increasing their information collection, and dissemination strategies through the use of the varied social media platforms like WhatsApp, Facebook, Twitter(X), YouTube, blogs, and wikis [….].
>
> [….] the directives have in one way or the other increased COVID-19-related information collection, and dissemination, especially on social media platforms […] we strongly believe that the increased funding support from the central has greatly the low mortality rates during the peak of the COVID-19 pandemic [….]. "

RQ4: ***The potential risks of using social media platforms for COVID-19-related information collection, and dissemination***

On the potential risks of using social media in public health information collection, and dissemination on COVID-19 control in Ghana responses were solicited from the heads of the Department of Ghana Health Service. According to the condensed responses from the interactions, 20 out of 27 heads of departments of Ghana Health Service indicated the key and common limitations of applying social media for public health information collection, and dissemination. Some of the common limitations are summarized below;

> […] poor network/connectivity internet, followed by validity and reliability of data/information, high internet data cost, language barrier, high cost of smartphones, unreliable power supply(electricity), and inadequate knowledge by health seekers/general public on the use of social media (low media literacy) […].

Further observations are made by the heads of departments on the limitation of social media for COVID-19 public health communication;

> […] For some of us in the health department, one of the key limitations of social media for public health information collection, and dissemination on COVID-19 relates to the digital divide with the Ghanaian population […] various groups of people within the population are disadvantaged as a result of illiteracy, language and other related barriers that prevent them to have full access to the public health information shared on social media platforms…"
>
> "…fake news in the form of misinformation and disinformation limit how we use social media to conduct health information collection […] people distort most of the credible health-related information posted on social media […].

Notwithstanding the tremendous roles of social media in public health information collection, the application of social media platforms in information collection by health professionals, and health institutions is still bedeviled with some great setbacks;

> […] The key challenges identified in this study include; difficulties in ensuring compliance, misinformation management, and the issues of privacy […] Social media as the preferred national (Ghana) communication platform has introduced great risks to users and is the main source for creating health-related fake news content as well as distribution […].
>
> [...] In my opinion, another challenge identified for the application of social media platforms for information collection in this study is the exclusion of a critical subgroup of our population from having first-time health news[…] These subgroups include; aged, physically challenged, people with cognitive disabilities, elderly, and people with low media literacy skills[...] these groups are considered as the most vulnerable groups;

> hence they should be the first to benefit from any health communication interventions[...].

Another risk reported in this study by the heads of the departments of various health institutions about using social media for public health information collection is the too much involvement of politicians in matters of public health on social media. The following are some remarks from the heads of departments;

> […] The public health communication error committed by politicians in Ghana is the reason I have always maintained that public health communication on social media should be done by health professionals and not communicators of political parties who do not know medicine and public health [....]. […] It is with the Mandate of the Public Health Act that The Director-General of the Ghana Health Service, the Public Health Director, the Director in charge of Immunization, and the Ministry of Health are pushing for the vaccines to reach every nook and cranny of this country…"[…] A recent post one politician social media which I feel inappropriate is “no one can force anyone to take a COVID-19 vaccine […].
>
> […] If we go and read the Public Health Act of Ghana! The Minister for Health and his deputies (Even though I can say on authority that of their limited knowledge in Health, they have not read the act themselves, hence their inability to come out forcefully to allay the fears of the public and to rally support with the help of social and mainstream media influencers for a vaccination drive) is empowered to declare a vaccine mandate to protect the citizenry […].
>
> […] COVID-19 and other public health communication on social media must be handled by health professionals […] Again, China adopted this strategy of health professionals leading communication on COVID-19 information collection and have succeeded in reducing COVID-19 spread in mainland China[…]The enhanced surveillance we are undertaking, the Gene Sequencing, and how we are rolling out the COVID-19 vaccination[…] We cannot continue to overshadow the great work of the health personnel who remain in the background almost forever while we ride on the back of their work for political gains[...] Let's make their work known, appreciate their progress and reward their efforts[…].

From the interviews (14) heads of departments of the Ghana Health Service reported the following limitations as major setbacks in the application of social media for public health communication:

> […] It is clear that language usually used on social media platforms must be localized to encourage the majority of the general public to derive the full benefit thereof from social media […].
>
> [….] One of the notable critiques of social media for public health information collection is the way the public health regulations or information are reported [….] the nature in

> which the regulations and measures that were put in place were conflicting [….] some respondents were saying they do not make sense[...]for instance, some of the respondents pointed out that some of the messages that were being shared with the public were not consistent, for example when they suggested that physical distancing should be two meters at one point, but in other instances, it is 1.5 meters[…]there are also instances where institutions such as public schools and transit have no guidelines about social distancing[…]some respondents also felt that it was important that resources are availed to help in the implementation of public health measures, for instance, the provision of free masks, funding to support distancing in schools[...].
>
> […] we believe the challenge of applying social media for public health communication is the inability of public health campaigners or implementers to control the kind of COVID-19 information shared by members of the online community […] This overabundant and uncontrolled information on social media leads to fake news, this disinformation, and misinformation..." "…the security and authenticity of data/information collected on COVID-19 is the highest risk associated with social media […].
>
> […] breach of privacy/ethical issues, attacked by hackers, and insults by the general public, respectively, as the risk associated with the use of social media to collect data/information on COVID-19[….].

5. Discussion

The in-depth interviews with the frontline health professionals, and public relations officers revealed that most of the respondents used at least one of the social media types such as WhatsApp, Facebook Twitter(X), and YouTube. In responding to the first research question on the most predominant social media platform for COVID-19 information collection, and dissemination, 17 out of 27 respondents, (regional public relations officers, district public relations officers, and regional public health officers), identified varied social media platforms are used. In terms of ranking, the findings showed that WhatsApp was the first choice social media platform for the collection and dissemination of COVID-19-related information, closely followed by Facebook. This trend from this qualitative analysis followed a relatively similar fashion to the views of the COVID-19 team leaders/contact tracers except for blogs, YouTube, and X (Twitter) which were included in the list by the respondents. These findings pinpoint that frontline health professionals, and public relations officers were all aware of social media types for COVID-19 mostly public health communication delivery. In addition, these findings suggest that the application of qualitative study enabled the researchers to obtain as much as possible data/information on the effectiveness of social media for COVID-19-related information collection and dissemination. These findings suggest that social media was predominantly used for COVID-19 public health communication efforts and in line with previous studies by Funget al., (2015); Marmot et al., (2020); Wittbold et al., (2020); Zhu et al., (2020).

In response to the social media content type used to share COVID-19 related- information on the official digital accounts of hospitals, 24 respondents indicated that they use social media platforms such as text (such as news releases & blog posts), videos, photos, digital flyers, and podcasts were used for sending educational messages on COVID-19 to the general public and online audience. The interviewees indicated that the choice of these types of digital content is used to educate online audiences on the mode of transmission, causes, signs, and symptoms, prevention, and updates of the infection; causes of COVID-19, signs and symptoms, prevention, treatments, and to keep the COVID-19 protocol. While, 3 respondents mentioned that, they use varied social media content types primarily for public compliance and treatment of COVID-19. These findings are in line with earlier studies conducted by Antwi-Boasiako, and Nyarkoh, (2020); Bannor, et al., (2017) who investigated the effectiveness of social media for communicating health messages in Ghana. that they use social media. On the positive impact of social media on COVID-19 information collection and dissemination the findings show that social media for public health communication, is very relevant for health education and promotion, surveillance, enhancing public awareness, reducing pandemic transmission, and prevention during the COVID-19 pandemic. The findings further acknowledged that in a developing country such as Ghana, where the healthcare systems are not so developed and lack the financial resources to carry out large face-to-face public health information collection, the application of social media platforms in times of public health emergencies is highly recommended. Again, the above findings are supported by an earlier study by Statucki et al. (2020) who have acknowledged that social media and other digital technologies like WhatsApp, Facebook, Twitter(X), YouTube, and blogs, indeed have great potential as far as transforming general communication health awareness, and education are concerned.

Furthermore, research question four of the study investigated the potential risks of using social media in public health information collection and dissemination during the COVID-19 pandemic. There were 27 frontline health professionals, and public relations officers of the Ghana Health Service and sample hospitals classified as focus group participants which emphasized the application of social media in public health communication, with emphasis on COVID-19. These factors were looked into and they included wearing face masks, keeping social distance, staying away especially when one is ill, keeping away from high-risk places such as bars, making use of contact tracing apps, and ensuring that vaccine is taken. Four additional themes were identified. They include the significance of putting up with public health protocol, critique of messaging, and some of the suggestions meant to improve the aspect of messaging. Masking and keeping social distance were mostly identified as more important compared to contact tracing apps as a way of minimizing transmission of coronavirus. On the other hand, wearing masks was perceived as the easiest way to comply with the measures. The respondents insisted that there was confusion in messaging and most cases, very unclear. Several barriers to adherence to using social media for public health communication protocol were identified, for instance, the conflicting public health messaging. There is a need to carefully frame health messages that are meant for the public. This can be achieved through understanding the needs of different audiences on social media. The findings from this study are in line with previous studies by Malecki, Keating, & Safdar (2021); Bannor,

et al. (2017); Khamis, & Geng (2021) who observed that the use of social media in health delivery comes with some potential risks like compliance, privacy issues, and the digital divide. With these in mind, the study sought to ask for country-specific potential risks from the viewpoint of the frontline health professionals, and public relations officers of the Ghana Health Service.

5.1. Recommendations for Practical, and Future Policy Directions

The use of social media in response to COVID-19 ushered in a promising new milestone in the execution of mass global public health response and interventions. This study evaluated the effectiveness of social media for COVID-19 information collection in Ghana which could be useful for other regions and countries in the fight against COVID-19 and future pandemics. These social media platforms minimize the burden of patients' continuous self-reporting and circumvent recall bias from infected persons. Additionally, social media platforms can facilitate pandemic strategic response in ways that are difficult to achieve manually. Also, the pandemic has accelerated the rate at which new media platforms are being integrated into healthcare service delivery to decrease exposure among frontline healthcare and non-healthcare workers. Therefore, regular training for the staff of Ghana Health Service on the use of various new media platforms such as social media is highly recommended.

Forming the findings, the frontline health professionals, and public relations officers of the Ghana Health Service interviewed, made it clear that there is a need to provide state-of-the-art devices for use among health professionals, and regularly update staff on how to effectively and efficiently use social media tools in health delivery and provide needed financial resources to sustain the gains in social media during projects/emergencies like COVID-19, pandemic.

Our findings reveal that the usage of social media platforms among health workers exposes several challenges that need urgent attention from the government of Ghana, the Ministry of Communications, and telecommunication companies to make data services affordable and reliable to harness useful benefits in the fight against COVID-19. Public health management globally has long been underfunded compared to other areas of health. Therefore, long-term changes require deliberate investments in national and international digital centers of excellence with the needed balance of partners and pre-agreed access to digital technologies with a substantial investment in workforce education, skills, and facilities to derive the full benefits to the country.

6. Conclusion

The general public health requirements also need to be well articulated for easy consumption by the targeted groups. The respondents also recommended conscious efforts to educate all segments of the citizens, especially those who use social media platforms. This would be a significant foundational move towards improving adherence to public health protocol. By doing this, the understanding of the characteristics, attitudes as well and behavior of the public would be improved. The next step is to use the information to come up with a public health messaging system that is aimed at encouraging change of behavior as far as the observance of COVID-19 protocols to curb the spread of the virus is concerned.

The respondents gave several suggestions on how to use social media for health information collection to change the behavior of mitigating COVID-19, as well as ways to enhance communication in and when frontline health institutions so that the measures put in place can be effective. It was important that messaging is improved through reframing in three different ways. Social media for public health information collection and dissemination should be framed in such a way that it protects others and not yourself, giving more scientific rationale, and highlighting the significance of the behaviors so that society can come back to normal. The participants also pointed out that, the tailored messaging strategies need to target specific population segments, for instance, the young.

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