Original Article

COVID-19 outbreak and integration of social media in public health crisis communication: a case study of UMMC, Kuala Lumpur

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Background: With the importance given to social media in crisis communication in the modern digitalised world, especially in a public health crisis, this research aims to unfold the strategies and the usage of social media by University of Malaya Medical Centre (UMMC) located in Kuala Lumpur, Malaysia, in the crisis communication process during the pandemic of coronavirus disease 2019 (COVID-19) outbreak.

Methods: This study employed qualitative methodology. The samples chosen for this study was social media postings by UMMC related to COVID-19 pandemic on its social media accounts, specifically Instagram and Facebook. By utilising Crisis & Emergency Risk Communication (CERC) as a framework a total of 231 social media postings, 173 posts from Facebook and 53 posts from Instagram were respectively chosen and analysed on the means of qualitative content analysis.

Results: The study findings showed that Facebook was aligned with the CERC framework in its messaging principles to a greater extent in comparison to Instagram. The use of Facebook was demonstrated to combat misinformation while live broadcasting and video messaging tools on Facebook was utilised to create engaging content and to create interaction with the audience. Infographics emerged as dominant content type while UMMC used organisation and pandemic specific hashtags to brand its content and increase reach.

Conclusions: The study highlights the need for a consistent and cohesive crisis communication strategy which takes guidance from a crisis response framework such as CERC that spans across different crisis phases and across different social media platforms.

Keywords: Crisis communication; social media; coronavirus disease 2019 (COVID-19); Crisis & Emergency Risk Communication (CERC); public health

Introduction

Background

As we are living in the digital era, modern technology such as social media has swept across every industry making the society more connected and gaining access to information has been easier than ever. With the significance of social media, usage of these mediums in crisis communication has grown immensely, especially in areas which concerns mass public such as public health crises (1-3). Media's role in influencing health behaviour has been extensively examined and established as a significant contributing

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factor (4). Firstly, social media allows both individuals and organisations to disseminate information expeditiously and in the current digital communication environment social media plays an increasing role in constructing public opinion of risk (5). Secondly. while in the traditional form of crisis communication, where there is only a top-down, one way communication system, social media has conceded a multi-dimensional communication approach where the stakeholders or the audience can actively participate and engage in the crises (6). Furthermore, social media allows the creation and dissemination of crisis response in various formats such as videos, pictures, etc. to a large audience in the most cost-effective manner (7). Due to these reasons, social media has become a key mediating channel of communication in different crises from natural disasters to public health crisis.

While social media provides several opportunities to communicate with the public in a dynamic crisis environment such as the coronavirus disease 2019 (COVID-19) pandemic in comparison to traditional forms of media, communicators are required to carefully construct the social media messages to obtain the most favourable outcomes. One of the vital aspects of social media is the ability to engage with the audience, hence it is vital for communicators to respond to comments and questions by the public through social media with timely credible information (8). By directly engaging with the audience and maintaining an open conversation, it helps

to counter rumours that may arise amidst the crisis. The open discourse which is possible on social media creates opportunities for governments and health authorities to directly engage and create dialogue with the mass public swiftly, while it also provides the public a mean to reach their government representatives with concerns during a crisis (9).

The capabilities of social media in a crisis goes beyond communicating to the public. Firstly, research has suggested that social media can be a valuable tool for social listening, and to identify immediate threats within the community and if it needs to be addressed with urgency (10), this can be a valuable tool for governments and health authorities to assess the situation and public perception of the risk and act accordingly in a timely manner. Furthermore, social media has also been utilised as a resource by health specialist and government decision makers in making informed decisions. Social media enables assessing the communities emotional shift and deliver up to date and dynamic information with regard to the communities' awareness and response to the crisis situation (11). This improves the crisis response by providing a more refined understating of the evolving situation. Moreover, in recent times, social media has increasingly become a supplementary surveillance tool for epidemic monitoring, and influencing the decisions made by health experts and health officials (12). These facets of social media underscore the importance of this medium in a crisis situation not only for crisis communicators, but also for governments and health experts in navigating through challenges in a crisis such as the COVID-19 outbreak.

The focal location of this study is Malaysia, a developing nation in Southeast Asia with a population of 33.9 million people (13) has 29.5 million internet users (14), while there are nearly 28 million social media users (15). The sheer number of social media users demonstrates the importance of social media in communication and the opportunity to reach a vast majority of the population in an event of a crisis providing them with vital crisis response information.

COVID-19 pandemic has been recorded as one of largest global public health crisis in history of mankind which had major economic, social and health impacts on every corner of the world (16). Malaysia reported its first sporadic case of COVID-19 which subsequently led to a Movement Control Order (MCO) being imposed on March 2020 as a crisis intervention measure (17). In wake of the COVID-19 pandemic, social media became an important communication channel. With countries imposing border closures, travel restrictions and shelter in place directives, the usage of social media to stay connected and access

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Highlight box

Key findings
- University of Malaya Medical Centre (UMMC)'s crisis response on Facebook exhibited better alignment with Crisis & Emergency Risk Communication (CERC) than Instagram. However, both Instagram and Facebook could be better aligned with CERC across different phases of the crisis while maintaining consistency between the two platforms.

What is known and what is new?
- This study reveals how crisis communication by a health institution aligns with the CERC communication framework when applied in a non-western setting.
- Social media tools and features plays an integral part in creating reach and engagement in a crisis.

What is the implication, and what should change now?
- Consistent and cohesive communication efforts that spans across different social media platform and phases of crisis are needed to improve crisis communication.

information increased significantly (18).

Public health communication through news media is a crucial intervention tool used to direct behavioural change within the public during a crisis that requires the public to adapt new norms and practices. A study conducted in the United Kingdom amidst the COVID-19 pandemic suggested that how scientific information is presented to the public affects the mobility of the public (19), this study further elaborated that Nature of Science (NOS) contents on news media had better influence on public movement in comparison to data such as the number of COVID-19 cases. Findings from this study displays the role of media as a vital channel to disseminate awareness based scientific information in a crisis to provide non clinical intervention. However, often times non clinical interventions such as health communication through news media is presented to the public through a political lens, and this issue highlights the need for the dissemination of unbiased scientific information to the public (20), and authoritative health institutions such as hospitals could play an important role in communicating impartial and unbiased health information to the public. The role of social media as a medium of communication during COVID-19 went further than informing the public on crisis related information, but also as a channel for scientist and medical researchers to share crucial information within the scientific community online (21). This underscores the potential opportunities of social media as a comprehensive tool to facilitate real time communication within the complex environment of the pandemic, not just for disseminating information but also for scientific collaboration between health authorities.

Rationale of the study

Although social media presents several possibilities and approaches to communicate with the public during a crisis, mediating crisis communication through social media still prevails as a challenge for authorities, and the communicative presence of authoritative sources on social media are known to be lesser than the members of the public during crises (22). Due to the multifaceted communication possibilities of social media, public expectations on crisis response have changed as the public demand for immediate response and engagement has increased. However, research shows that crisis communicators are still employing the one-way top-down approach on social media which does not meet the public expectation creating a gap in communication (23).

In a public health crisis such as the COVID-19 pandemic, health authorities are obligated to provide the public with the most up to date information surrounding the crisis. Maintaining a constant flow of information with the public would encourage them to be updated regarding the crisis and take an active role in battling the crisis during and in future occurrences (24). As the crisis evolves, the publics need for information also evolves, hence to fully comprehend crisis communication on social media and messaging strategies, it is important to explore messages that is being deployed to the public through social media in different phases of the crisis. By exploring the crisis messages on social media platforms against the backdrop of the Crisis & Emergency Risk Communication (CERC) model it would give a clear perspective on socially mediated crisis communication.

CERC model developed by Centres for Disease Control and Prevention (CDC), USA. is one of the most highly regarded crisis response frameworks, as it provides comprehensive guidance to crisis communicators on response strategies and principles (25). This model outlines that every crisis unfolds in five different stages and presents the most ideal strategic communication practices for each stage of the crisis lifecycle together with best practices to be implemented in any form of crisis (1). CERC is built upon the foundations of the existing crisis communication theories and models and integrates the best strategies to be implemented in a crisis situation (26). Although traditionally crisis and risk communication are viewed as separate communication areas, CERC is one of the few models that amalgamates both crisis and risk communication to provide a comprehensive approach in this area of communication (27). While there are several studies conducted with CERC as a backdrop to analyse crisis communication, a vast majority of these studies has been conducted in United States where the framework was developed or in other western settings. However, studies concerning application of CERC by health authorities such as hospitals are limited. This study employs CERC framework as a backdrop to facilitate the analysis of social media usage by University Malaya Medical Centre, one of Malaysia leading medical institutions in their crisis communication during the COVID-19 pandemic.

Social media allows anyone to create and disseminate information to a large audience at a fast pace. While rapid dispersal of information at a timely manner is deemed crucial at a crisis, this creates a state of information overload on social media platforms leading to the spread

of misinformation. Due to the copious amount of misinformation surrounding COVID-19, World Health Organization (WHO) Director-General Tedros Adhanom Ghebreyesus has stated the world is not only battling with a pandemic but also an infodemic (28). With the current state of false information surrounding COVID-19 pandemic, it is important to explore this issue from the perspective of crisis messaging strategies implemented to battle misinformation on social media.

Social media platforms allow diverse and dynamic means to create and disseminate information. These platforms are equipped with several tools and features to produce and share content. Two of the most highly used social media platforms in Malaysia, namely Facebook and Instagram allow its users to create and retrieve information through various forms such as texts, videos, live broadcasts, real time conversations etc. As these platforms are evolving, new features are constantly added that could be utilized by health authorities and crisis communicators to enhance communication with the public on social media. However, to yield the best of these features and tools in a crisis, it is important to explore how these features are being utilized and how it could be better implemented in the crisis communication process to provide timely and accurate information which the public would engage.

Research objectives

In reviewing the expansive literature on crisis communication, it can be signified that there have been very few studies conducted on crisis communication in the context of hospitals around the globe while hospitals are susceptible to multitude of crisis from both external and internal factors (29). With the importance given to social media in crisis communication and the role of social media during COVID-19 pandemic, this study seeks to have a deeper understanding of the usage of social media in public health crisis communication by UMMC. To shed light on all the issues presented formerly, the main objectives of this qualitative research would be (I) to explore the types of messages posted on Facebook and Instagram in different phases of the COVID-19 crisis by UMMC with regard to the CERC model of communication; (II) to explore strategies by UMMC to combat the spread of misinformation on social media during the COVID-19 pandemic; (III) to discover how purposeful social media tools and features are utilized by crisis communicators in UMMC in communicating with the public through

Facebook and Instagram during the COVID-19 outbreak.

Methods

Research design

To explore the usage of social media by UMMC during the COVID-19 pandemic this research employs qualitative research methodology. Within the boundaries of the qualitative research methodology, the approach of case study was applied in this exploration. Firstly, the case of COVID-19 pandemic was chosen for this study as this pandemic has been the largest public health crisis in the recent era which disrupted lives across the globe, and this outbreak has caused several serious implications to the world including the Malaysian community (30). Secondly, UMMC's social media were chosen since UMMC was selected as one of the centres to manage COVID-19 in Malaysia (31). Furthermore, UMMC was declared as the first COVID-19 hybrid hospitals in Malaysia, treating Covid patients and non-Covid related patients (32). Since crisis response from health-related authoritative sources are considered vital in a public health crisis and leading medical institutions are highly likely to receive the most focus in an event such as COVID-19 outbreak, UMMC serves as an ideal focal point for an in-depth exploration of social media crisis communication in a pandemic.

As social media is a generic term referring to social networking channels mediated by digital devices where users can create and share information, to make this research precise and specific, the focus was narrowed down to Facebook and Instagram. These two platforms were chosen by reviewing scholarly research which indicated their popularity, effectiveness, and widespread usage in crisis communication (1,33,34). As per statistics, Facebook and Instagram were noted as Malaysia's top two social networking sites, with 84.8% active Facebook users and 74.3% active Instagram users within the group of active internet users (35). UMMC has its official pages on Facebook and Instagram, and these social media pages provided regular updates on the COVID-19 pandemic. The official Facebook and Instagram pages of UMMC are accessible to the public and disseminated crisis related information in various media formats. With social media posts as the data source, this study investigated the types of messages disseminated by UMMC through social media in different phases of the crisis concerning the CERC model of communication, the strategies to combat the spread of

	Wave 1	Wave 2
Initial	1st March 2020–26th March 2020	7th September 2020–11th January 2021
Maintenance	27th March 2020–14th April 2020	12th January 2021–5th February 2021
Resolution	15th April 2020–6th September 2020	6th February 2021–31st March 2021

Figure 1 Time frame for social media posts according to crisis phases.

misinformation using social media in crisis communication together with finding purposeful social media tools utilized to communicate with the public through social media during COVID-19 pandemic.

Research sample and sampling method

The samples chosen for this study was social media postings by UMMC related to COVID-19 pandemic on its social media accounts, specifically Instagram and Facebook. A total of 245 social media postings, 174 posts from Facebook and 71 posts from Instagram were respectively chosen and analysed. The samples were chosen based on purposive sampling where the researcher purposely chooses specific samples depending on the information the samples impose in field of study specified by the researcher (36). The selection criteria for the social media posts were based on four key benchmarks: COVID-19, health intervention, crisis information and COVID-19 response communication. These benchmarks encompass content relayed through either texts or visual means. The samples were chosen within the time of 1st March 2020 to 31st March 2021. The motive of choosing the sampling duration from 1st March 2020 to a period of one Calander year is because March 2020 signified the month WHO declared COVID-19 as a pandemic, and at the same time on March 2020 Malaysia had its first sporadic case of COVID-19 while the government of Malaysia consecutively imposed a Movement Control Order. Within the stipulated time frame allocated for data collection, all social media posts by UMMC on Facebook and Instagram fitted into the selection criteria of this research, and was chosen to be analysed. This leaves out the possibility of any unrepresented samples within the pool of social media posts within this time frame. Based on the observation of COVID-19 statistical case graphs in Malaysia, within the chosen time frame of March 1st 2020 to 31st March 2021, three different phases of the COVID-19 crisis according to CERC was recognized

which occurred in two consecutive outbreak waves. They are initial phase, maintenance phase and resolution phase The time duration for wave 1 and wave 2 has been outline in *Figure 1*. To analyse the data, the method of qualitative content analysis was employed. *Figure 2* illustrates the procedure followed in this study for content analysis.

Coding sheets were utilised to arrange the raw data into an orderly manner. The coding sheets specified the social media platform the posts belonged to, the phase of the crisis the posts belonged to and included the pre-identified theme according to the content in the social media post. Five themes were chosen based on deductive coding from the messaging principles of CERC. Deductive coding is when the researcher already has pre-determined themes, codes or concepts derived from theories or models related to the subject being studied (37). Moreover, pre-identified set of themes or codes could also be derived from the conceptual framework, research question, theoretical framework, data collection modes such as interviews or observations (38). The five themes are: (I) risk messages: which explains the details about the virus, how they are spread and information such as signs and symptoms if contracted with the virus; (II) warnings: posts that's explains the hazards and dangers of coronavirus and outlines the dangers associated with it; (III) uncertainty reduction: data such as the number of cases, where the virus clusters are located and other related information such as locations where positive cases are identified; (IV) efficacy: posts that specifies precautionary courses of actions and obligations of the community such as wearing face masks in the public, washings hands and social distancing; (V) reassurance: postings that reassures and empowers the distressed public and appreciates the effort of the public in fighting with the outbreak (1,34). The main five themes were further divided into subthemes. The subthemes were also established on the grounds of deductive coding based on similar literature which utilised CERC framework and its principles to analyse crisis related information and derived from the essence of the meaning behind the main themes as described by the CERC
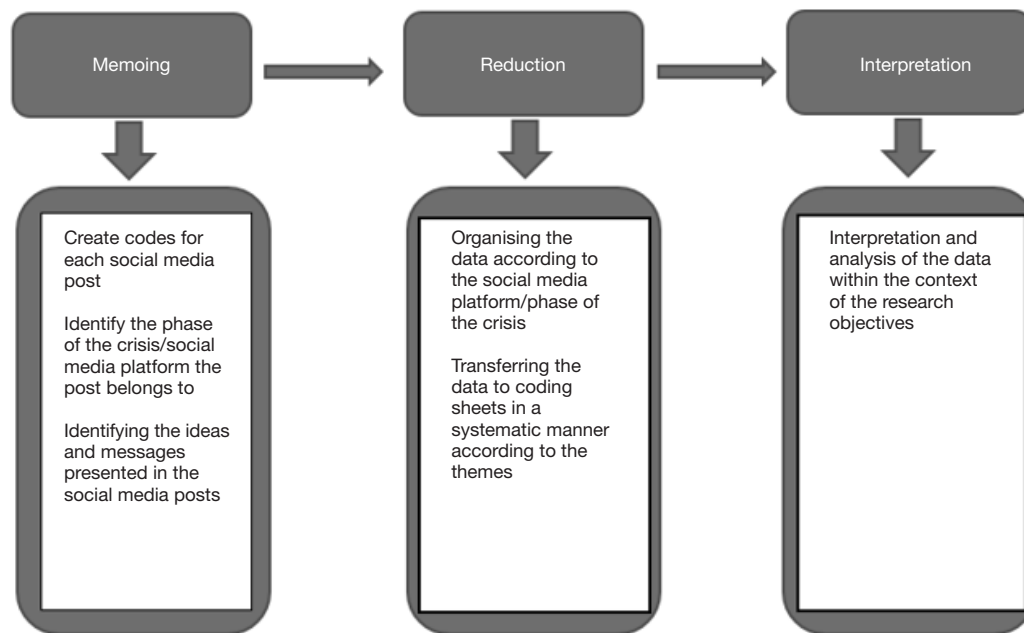
Figure 2 Content analysis procedure.

framework (1,34).

The subthemes utilised for the analysis of data under each main theme are: (I) risk messages: (i) disease information: which provides any information regarding the COVID-19 virus and the disease, (ii) symptoms: any symptoms related to COVID-19; (II) warning: (i) risk factor: any information pertaining to associated risk surrounding the COVID-19 pandemic, (ii) dangers: any posts that highlights the dangers posed to the community with regard to COVID-19; (III) uncertainty reduction: (i) case reports: updates on the number of cases of COVID-19 in Malaysia and any information that provides case numbers associated with COVID-19 such as the number of hospitalised COVID patients or death figures associated with COVID-19, (ii): information resources: any posts that provides information resources to the public such as COVID-19 hotlines in Malaysia; (IV) efficacy (i) personal prevention: posts providing information on any specific personal preventative measure for the community such as social distancing and wearing of face masks, (ii) common responsibility: post providing directions or information on the responsibility of the community members in tackling with the outbreak such as staying at home or shelter in place; (V) reassurance: (i) calming: posts that provide calming messages to the public to reduce the public uncertainty and to reduce fear surrounding the

COVID-19 outbreak, (ii) thanks to the public: posts that shows gratitude to the public and expresses thanks to them for their role in keeping community safe and following the health guidelines, (iii) government intervention: Posts that depicts the work done by the government and authoritative sources to curb the spread of the virus and control the outbreak such as the enforcing movement control order and the COVID-19 vaccination drive for the Malaysian community. *Figure 3* depicts the five themes and its subthemes used in this study.

After the memoing stage, the data was then reduced. For this study, in the process of data reduction, the collected social media postings were reduced into the stages of the COVID-19 Outbreak in Malaysia within the determined time frame for this study which was from 1st March 2020 to 31st March 2021, namely initial phase, maintenance phase and resolution phase of the crisis. The data was then arranged in coding sheets to its respective phases of the crisis. *Figure 4* depicts an extraction of the coding sheets used in this study. The crisis phases in Malaysia for the chosen time frame for this study was determined using graphs which showed the number of COVID-19 cases in Malaysia and these graphs have shown how the crisis unfolded in Malaysia. By observing these graphs while reflecting on the crisis lifecycle explanations by CERC, and other studies which has used CERC model as framework,

the crisis phase for each social media post was determined. Based on the examination of these COVID-19 graphs, and the CERC crisis lifecycle, it has been observed that the

Theme	Sub-theme
Risk messages	i. Disease information ii. Symptoms
Warning	i. Risk factors ii. Danger
Uncertainty reduction	i. Case reports ii. Information resources
Efficacy	i. Personal prevention ii. Common responsibility
Reassurance	i. Calming ii. Thanks to public iii. Government intervention

Figure 3 Themes and subthemes utilised in the study.

COVID-19 crisis unfolded in two different waves within the time construct of this study, *Figure 1* depicts the time frame of the crisis phases. The Centres for Disease Control and Prevention (CDC) has also stated that although the CERC model of communication shows the progression of crisis phases, a crisis lifecycle is fluid, and as the crisis advances it may also move back in crisis phase (39). In the final stage of the data analysis, the social media postings were analysed and interpreted.

Results

The CERC model of communication which the conceptual framework of this research is based states the five stages of a crisis for crisis communication. However, within the duration of the chosen data for this research, the analysis depicts that the social media posts aligned into three phases of the CERC model. The phases of the crisis the data aligned was Initial phase, Maintenance phase and resolution phase of the crisis. The analysis finds that there are several

Social Media Platform: Facebook		Crisis Phase: Maintenance (Wave 1)	
Social media post	Description	Excerpt/Keyword	Social media tools/Features
27th March 2020 **Theme: Risk Messages/ Uncertainty Reduction** *(Disease information/Information resources)* 	Live broadcast by UMMC on Facebook where viewers can ask disease information on COVID-19 and the experts can give answers in real time. This creates direct interaction between the experts and the viewers via Facebook.	COVID-19, You ask-expert answer	Live broadcast
27th March 2020 **Theme: Warning/Efficacy** *(Risk factor/personal prevention)* 	Post in Bahasa showing information on the duration coronavirus can survive on different surfaces. This post also contains information on personal prevention measures on how to disinfect surfaces.	How long a coronavirus lives on the surface	Infographic

Figure 4 Extractions of the coding sheets used in this study.

Table 1 Highlights of the results from the initial phase of the crisis

Facebook	Instagram
Theme risk messages were less emergent in the initial phase of the crisis	No COVID-19 related post during wave 1
Risk messages were often presented with other themes in the same post	Content with the theme risk messages were notably scarce
Mainly warning messages were used to combat misinformation during wave 1, while no warnings messages during wave 2	No warning messages were found on Instagram during waves 1 and 2 of the initial phase
Uncertainty reduction messages was also found to be associated with combatting misinformation in the initial phase	Hashtags were utilised in post captions, to depict the messages presented in the post content and the COVID-19 pandemic
Clear and direct post captions were used to refute misinformation	
Content with the theme efficacy was notable during initial phase. Sub-theme of personal prevention was apparent during wave 1	

COVID-19, coronavirus disease 2019.

Table 2 Highlights of the results from the maintenance phase of the crisis

Facebook	Instagram
Video messaging used on Instagram to provide disease information	No post depicting the theme risk message was found on Instagram
Facebook live broadcasting has been used multiple times as a mean for information resources	No live broadcasting (Instagram Live) feature used despite availability
During wave 1, uncertainty reduction posts contained both case report and information resources	Uncertainty reducing content was not found on Instagram
During wave 2 uncertainty reducing posts were less prevalent	Pandemic related hashtags were used on video messages as post captions
Limited reassuring posts were observed on Facebook	Reassuring post were absent from Instagram
Primarily the subtheme of thanking the public under reassurance was observed	

social media postings with an overlap of CERC principles. Hence, the dominant CERC principle exhibited from each social media post was chosen as the main principle for each post from the five CERC principles identified from the framework. The dominant CERC principle for each post were identified based on the textual, visual, and contextual messages of the post. A large portion of the social media posts were uploaded in Bahasa Melayu, the national language of Malaysia. However, both Facebook and Instagram contain auto translations tools embedded into them. This is a feature that could be used to translate captions, hence increasing the reach. *Table 1* depicts the highlights of the results from the initial phase of the crisis, while *Table 2* illustrates the highlights of the results in the maintenance phase and lastly *Table 3* shows the highlights

from the results in the resolution phase of the crisis.

Crisis phase: initial

The initial stage of a crisis is described as the acute stage of the crisis where the crisis begins to unfold (40). During the initial phase, focus of the social media postings was on Facebook comparative to Instagram, specifically during wave one of the initial stages of the crisis lifecycle, there was no postings made on UMMC's Instagram page dedicated for COVID-19 response. During the initial phase of the second wave, the utilisation of hashtags was found in the content captions on Instagram on a more consistent basis comparative to Facebook. The hashtags were related to the pandemic and UMMC, and specific hashtags such as

Table 3 Highlights of the results from the resolution phase of the crisis

Facebook	Instagram
Risk messages were notably scarce on Facebook during the resolution phase	Postage of content with risk messages were prominent
Wave 2 of the resolution phase saw an absence of warning messages	Infographic content on Instagram was accompanied by related caption
Uncertainty reduction presented through various formats of infographic	Distinct pattern of warning messages observed on Instagram
Case reporting presented via infographic in various formats	No warning messages observed during wave 2
Emphasis on COVID-19 vaccine related information was found during wave 2	No uncertainty reducing messages during waves 1 and 2 of the resolution phase
Reassurance posts focused on government intervention	Reassurance posts focused on calming messages

COVID-19, coronavirus disease 2019.

#COVID19 #UMMCKL #bebravebesafe were consistently used on the Instagram posts. The analysis from both Facebook and Instagram during this phase exhibited that the theme risk messages were less emergent, particularly on Instagram. Risk messages were often intertwined with other themes in the same posts commonly in the form of infographic posters which enhanced message interpretation.

Warning messages during the wave 1 of initial phase of the crisis was found on Facebook. However, during the initial phase of the second wave, warning messages were noticeably absent. Notably, no warning messages were observed on UMMC's Instagram page. Posts reflecting the theme warning seemed to be utilised to combat misinformation on Facebook alongside visual elements to identify and denounce fake news with clear explanations in captions. In relation to misinformation the social media posts aligned largely with the sub-themes of danger and risk factor. These posts which refuted misinformation employed eye catching headlines on the content to alert the public accompanied by related captions which emphasised the importance of relying on credible information sources.

During the initial phase, there was a notable presence of uncertainty reduction posts on Facebook during the first wave, with fewer posts relating to uncertainty reduction during the second wave's initial phase on both Facebook and Instagram. Conspicuously, during the initial phase of wave one, no content addressing uncertainty reduction was found on Instagram. Within the broader theme of uncertainty reduction, the sub-theme of case reporting was significant. Case reports provided detailed data on the COVID-19 cases in Malaysia. This was presented through reshared press releases by Ministry of Health Malaysia and infographic illustrations making it more accessible to the public. Infographics on case reports also conveyed the shared responsibility of the public during a pandemic.

Efficacy related posts were prevalent on Facebook during the initial phase with the recurring sub-theme of personal prevention. Infographic posts played a major role in messages with the theme efficacy. While some infographic had related captions, often these captions did not provide much information as most of the detailed explanations were presented via the illustrations. Additionally, UMMC utilised video sharing on both Facebook and Instagram to disseminate efficacy related information.

The messages of reassurance were delivered to the public via infographics, pictures and with re-shared press releases from sources such as Ministry of health. During the first wave, government intervention was notable as the prime sub-theme of reassuring posts while calming became the primary sub-theme for the reassuring content during second waves initial phase. For instance, a Facebook post depicted a picture of two police officials having their meals during the movement control order emphasizing government intervention to manage the pandemic.

Crisis phase: maintenance

Throughout the maintenance phase, a recuring pattern emerged as posts with risk messages were often meshed with other themes, much like the initial phase. However, no post depicting the theme risk message was found on Instagram. In contrast to the initial phase of the crisis, the prominent usage of videos was observed in disseminating risk messages markedly providing content on the risk

message subtheme of disease information. Notably, the Facebook live broadcasting feature was utilised multiple times under the title "You ask, Expert Answer". These interactive live broadcasts enabled live engagement with the audience with the assistance of the platforms chat functionality. The interactive live series on Facebook was conducted by healthcare specialist from UMMC, increasing the credibility of the institution.

During the maintenance phase, posts carrying the theme warning were notably limited and their absence during the first wave was remarkable. The few warning messages was disseminated in the form of infographics and reshared post from news agencies and other credible sources. One of the excerpts from a reshared post quotes Director General of Health Malaysia Dr. Noor Hisham which states "Dr Noor Hisham: Stay away from hospitals unless you absolutely need to be there." By quoting an authoritative figure it ensures the credibility of the information and counter misinformation.

During the first wave, Facebook posts containing uncertainty reduction encompassed both information resources and case reports. However, in the second wave of the maintenance phase, uncertainty reducing posts were less prevalent. Notably, there were no uncertainty reducing posts on Instagram during this period. Specifically observing on the subtheme of information resources, Facebook live broadcasting has been conducted as UMMC's "You ask, we answer" live broadcast series. This is in line with the findings observed in the initial phase of the crisis. Another live broadcast observed was reshared from MOH broadening the reach of critical health information. As live broadcasting provides the opportunity for the public to directly interact with health authorities, and for the health experts to provide credible information in real time, this serves as an opportunity to refute misinformation. The contents on case reporting were consistent with initial phase of the crisis. An identical method of infographic was utilized in the maintenance phase for case reporting.

In the maintenance phase, there was a decrease in posts with the theme efficacy compared to initial phase with a shift towards the sub-theme of personal prevention, although content with the sub-theme common responsibility was also evident. Graphic videos were utilised on both Facebook and Instagram to deliver posts with common responsibility. Some of the infographic video post on Instagram utilize relevant hashtags as a form of captions for some video message instead of a written caption.

Maintenance phase saw a relatively limited reassuring posts which were predominantly categorised into the sub-theme of thanking the public while government intervention was highlighted in one occasion. Facebook was utilised for the reassuring content while Instagram showed no evidence of such posts within this phase. One key example of expressing thanks included a video message which expresses appreciation for UMMC in fighting the pandemic. The caption of this video message was presented in Bahasa Melayu, and the translations conveying messages of gratitude. This content was accompanied by hashtags that has been commonly used during the pandemic by UMMC on its social media which highlights the collective efforts to combat the crisis.

Crisis phase: resolution

During the resolution phase, risk messages became scarce on Facebook while risk messages can be viewed prominently on UMMC's Instagram page. The principal method of channelling risk messages during this phase was through infographics which contained the sub-themes of disease information and symptoms. Some of the infographics within this theme were presented in the form of questions and answers Having infographic in the form of frequently asked questions provides an easy solution and an immediate update for readers to get answers to the most common questions they would have regarding a topic (41).

Contents on Instagram during wave 1 exhibited a distinct pattern of warning messages compared to Facebook. However, during wave 2 there was a notable absence of warning messes on both the platforms. Warning messages on Instagram carried sub-themes of risk factors and dangers often seen as hybrid themed postings, exhibiting characteristics and messages of other themes. Infographic posters with risk factors were delivered with clear and concise wordings to enhance comprehension. For instance, a reshared infographic from WHO highlighted high risk places such as crowded places, close contact settings, confined and enclosed spaces. This post was accompanied with a caption and hashtags which associates to UMMC pandemic related common responsibilities which reinforces UMMC's COVID-19 response.

During the resolution phase, Facebook posts with uncertainty reduction revolved around case reporting's through various formats including graphic illustrations, tables, and graphs. These posts extended beyond number of COVID-19 cases covering diverse area of statistics such as number of deaths. During wave 2 of this phase, content

on Facebook shifted towards the subtheme of information resources under uncertainty reduction particularly relating to COVID-19 vaccine. Prominent usage of videos was observed contributing to uncertainty reduction through information resources. However, Instagram data showed the absence of uncertainty reduction messages during both wave 1 and wave 2 of the resolution phase. Lack of posts related to combatting misinformation was noted during the resolution phase of the crisis on both Facebook and Instagram, with a single post refuting speculation related to COVID-19 vaccine was found on Facebook.

In terms of efficacy messages, Instagram featured infographic content often in English while Facebook content emphasised on video messages in Bahasa Melayu. Sub-theme of personal prevention can be seen as the centre of focus within the posts that contained messages of efficacy. Textual explanations visually conveyed the message for the infographics that lacked textual explanation within the infographic, while the caption of the post provided explanations. Furthermore, relevant hashtags were used to facilitate content organisation and community engagement.

In the resolution phase, data showed that there were several social media postings categorised into the theme of reassurance. Within reassurance, Instagram primarily focused on the sub theme of calming while government intervention was more evident on Facebook. For instance, a Facebook post during wave 1 of the crisis showed government intervention by sharing a URL of the YouTube video by the local TV channel TV3 which mentions UMMC studying two drugs to prevent COVID-19. This provides reassuring information to the public on the authority's intervention and work done to fight this pandemic at the same time acting as an information resource carrying the theme of uncertainty reduction. The ability to reshare videos and resourceful links from other sources increases reach for such vital informative posts on Facebook.

Discussion

Key findings

The findings of this study revealed that Facebook was deemed to be the primary platform used in crisis communication by UMMC, while Instagram was underutilised. The findings also disclosed the inconsistency of usage between Facebook and Instagram and the content strategy of Facebook better aligned with the CERC communication framework. The combat of misinformation was visible on Facebook with warning messages and strategies to increase UMMC's credibility although notable inconsistency can be determined throughout different crisis phases. Throughout the crisis several social media tools and features have been used, such as live broadcasting, video messaging, hashtags and resharing of content which enhances communication and creates engagement and wider reach amongst the community but it is worthwhile to note that the features and tools available on Instagram were not utilised to its full extent.

Explanation of Findings

Exploring the types of messages posted on Facebook and Instagram in different phases of the COVID-19 crisis by UMMC with regard to the CERC model of communication

In the initial phase of the crisis, CERC recommends having messages of uncertainty reduction, which includes case reports and information resources; self-efficacy, which are messages highlighting personal preventive measures and common responsibility during the crisis and reassuring messages which would contain calming messages and communicating to the public, the work done by the government to contain the crisis (1). The data indicated that the communication carried out on Facebook during the initial phase of the crisis closely aligns with the recommendation by CERC on the messaging strategy for uncertainty reduction. As uncertainties increases, the people's desire for information regarding the crisis that is disrupting their lives increases too (42). Uncertainty reduction has been carried with the usage of infographics particularly those about COVID-19 situation in Malaysia, such as case reports. Majority of these case reports were reshared from authoritative sources such as Ministry of Health Malaysia. Additionally, posts on uncertainty reduction pertaining to information resources was also reshared from authoritative sources. During wave 1, the context of reassuring messages focused on government interventions, while in wave 2 the reassuring messages focused on calming and thanking the public. Reassuring messages with calming and thanking was presented in the form of infographics. In addition to infographics, reassuring messages with context of government interventions was also presented through press releases which was reshared from MOH. This gives more insights, and critical news to the public without contracting the information. The data

showed that most of the message's reiterating calmness was uploaded on UMMC's Instagram page, but not on Facebook, and this could be deemed as a lost opportunity for consistent communication on both platforms. Several messages of efficacy were posted during the initial phase of the crisis with most of these postings emphasizing the importance of personal prevention. By emphasizing on both the underlying subthemes equally could enhance the messages of self-efficacy which could motivate individuals to take proactive measures while promoting a sense of responsibility for community health during the pandemic. The messaging strategy could be enhanced by using well researched communication approaches such as framing. As described by Matthew C. Nisbet, disseminating information through frames which takes into consideration the prevailing values and understanding of a certain subject matter of the audience, and constantly communicating the messages though trusted media sources and opinion leaders could generate favourable outcome in a crisis (43). Nisbet, further elaborated that framing messages works effectively, when the messages are aligned with or is pertinent to the audiences existing interpretation and this is inline with Coombs situational crisis communication theory which also states the importance of using audiences lived experiences and knowledge through past crisis situations to build crisis response (44).

During the maintenance phase CERC recommend continuing ongoing uncertainty reduction, self-efficacy, and reassurance. The data implies that uncertainty reduction messages were carried out on a more consistent basis in line with the CERC recommendation. As research suggests, regular uncertainty reduction messages would enhance public comprehension of the crisis and the risk involved (1). In this phase the reduction of uncertainty reducing postings with information resources was observed, and this finding aligns with a study conducted in Canada where media emphasized on case reporting's but lacked focus on information resources and call to action (45). During wave 1, postings with information resources were disseminate as videos and was conducted in the form of Facebook live broadcasting. One notable benefit of Facebook live broadcast is the opportunity for immediate engagement and interaction with the audience in real time, this would be an opportunity to simultaneously reach a mass audience (46). Within the context of uncertainty reduction, no postings were made on Instagram in this phase of the crisis which shows inconsistency in messaging. Although CERC suggests ongoing efficacy messaging, there was a significant

reduction in efficacy related posts in the maintenance phase. The ongoing reassuring posts on Facebook sending gratitude was mainly directed towards frontliners. As the public also plays a vital role in managing the crisis, it is equally essential to provide reassurance to the public, and this can be seen as a shortcoming in the approach of messages within the context of reassurance.

According to CERC principles, the messages in the resolution phase of the crisis are characterized by providing new understandings of risks and updates on the resolution of the crisis (47). Risk messages on Instagram during wave 1 of the resolution phase associates with the principles of CERC while the lack of such messages during wave 2 showed lack of consistency. The resolution phase of the crisis could be an ideal opportunity for crisis communicators to use frames to shape public perception on new risks regarding COVID-19 and new developments such as the COVID-19 vaccine, as the public has lived through the initial and maintenance phase of the crisis, the pre-existing knowledge of the public could be utilised as a mean to direct future communication approach. During wave 1, Instagram effectively addressed new understanding of risks such as information for mothers on breastfeeding during Covid, guidance for expecting mothers and emergent disease information. As CERC urges providing updates on crisis resolution in this phase, the messages, and updates by UMMC on Facebook with regard to COVID-19 vaccine closely aligns with the CERC recommendation. As reported by Organisation for Economic Co-operation and Development (OECD), importance of public trust in COVID-19 vaccines and the vaccination process cannot be overstated (48). Framing messages on this crucial aspect of the pandemic resolution would allow communicators to emphasize the importance of COVID-19 vaccine and the positive outcomes while guiding the public towards a constructive interpretation on the COVID-19 vaccines. Usage of video and live streaming can be seen consistently on Facebook during this phase on information resources regarding COVID-19 vaccine program in Malaysia. This includes reshared video messages from other sources which would assist in expanding the reach of content.

Exploring the strategies utilized on Facebook and Instagram by UMMC to combat misinformation during the COVID-19 outbreak

The spread of misinformation surrounding COVID-19 has been a major issue faced by many health authorities around the world and rumours are recognized as a hindrance in

fighting with the pandemic (49), hence it is vital to address and counter rumours in an institutional level to combat misinformation (50), and this can be seen from the data, as UMMC has also faced rumours with regard to COVID-19 response. Data indicated that combating misinformation was only carried out on Facebook, and no content related to misinformation was posted on UMMC's Instagram account. UMMC has leveraged on textual Facebook posts to combat rumours which dispelled and clarified misleading information circulating on social media as rumours. In the initial phase of the crisis, the social media posts that were deployed to counter misinformation was aligned with the CERC messaging approach of warning messages and uncertainty reduction. The contents of these posts explicitly communicated to the audience that the messages in question are untrue rumours and should not be considered as accurate. By directly debunking these rumours in a clear and concise textual format ensures that the audience is well informed and are equipped with accurate information since false information tends to be memorable in human minds (51).

Apart from counteracting rumours about UMMC, there has been postings reshared from MOH, Malaysia which addressed the spread of false information regarding COVID-19 and the consequences of false information. Resharing of social media content by Ministry of Health Malaysia on UMMC's Facebook can be deemed as a part of a collective strategy by health authorities as information resources to combat misinformation owing to the magnitude of the crisis and the amount of fake news online regarding the COVID-19 pandemic. As stated by Naeem, Bhatti & Khan (52), it is vital for health authorities, scientists, and journalist to see it as their obligation to assist the public in distinguishing fake news.

Dissemination of accurate information is not sufficed when combating misinformation, but the source of the information also must be coming from a credible source for the public to change the perception on fake news (53). Since credibility of the information source and the information provider is regarded as an important factor in combating misinformation, social media posts with the strategy of increasing the credibility and expertise of UMMC can be viewed on Facebook both on wave 1 and wave 2 of the crisis. UMMC established its credibility by sharing a URL of channel TV3 video discussing UMMC's study of two drugs to prevent COVID-19 and providing information about UMMC being one of the hospitals treating COVID-19 patients. Such information increases the perceived expertise of UMMC among the public and positions it as a reputable

authority in the domain of COVID-19 and public health.

UMMC has also utilized the strategy of public engagement with the aid of live-broadcasting on Facebook which allows real-time interaction with the audience aligning with Nierman's (54) perspective that public engagement allows crisis communicators to have control over the narrative surrounding the crisis thus it supports in the management of false information. However, it is imperative to acknowledge that these live-broadcast sessions by UMMC have been limited, inconsistently scheduled, and sporadically distributed across different phases of the crisis while the lack of importance given to Instagram by UMMC on combatting misinformation raises questions on the handling and planning of UMMC's crisis response and communication policy.

Exploring social media tools and features used by UMMC on Facebook and Instagram

The induction of social media in the communication sphere and its numerous tools and features has transformed crisis communication in recent years, and with the accessibility to various tools on social media, organisations can disseminate, obtain, and analyse information in a more comprehensive manner (55). UMMC's Facebook and Instagram analysis during COVID-19 reveals their usage of several social media tools and features which enhances crisis communication on social media.

The most common social media tool utilised by UMMC emerges to be hashtags. UMMC has consistently used hashtags such as #UMMCKL, #BebravebesafeUMMC, #PPUM, #dudukdiamdiam which translates to stay put, or shelter in place, and #staysafe #stopthespread #breakthechain in their social media content, which is distinct across Facebook and Instagram. The usage of hashtags by UMMC can be predominantly seen on Instagram, during both waves 1 and 2 of the crisis and more apparent on Facebook during wave 2 of the crisis, By drawing insight from past crisis scenarios and social media, it becomes evident that hashtags have enabled individuals to assume a more "performative and constitutive" role during the crisis (56,57). Hashtags are more than labels as customised hashtags like those used by UMMC reflects the organisation's identity and mission commitment enabling the organization to differentiate (58).

Another valuable tool is live streaming on platforms such as Facebook and Instagram. UMMC has utilised this tool on Facebook while directly engaging with the audience during COVID-19 pandemic, this aspect of instant and dynamic interaction exemplifies a growing communication

trend (59). However, the usage of the streaming feature by UMMC was limited to Facebook. The decision to disregard this feature on Instagram by UMMC signifies yet another missed opportunity considering the immense number of Instagram users in Malaysia. UMMC has also extensively reshared content from other authoritative sources such as Ministry of health Malaysia and World Health Organization. This practice allows UMMC to disseminate information to a wider and a diverse group of online users since resharing content provides more visibility and reach for the content.

The language predominantly used in UMMC's social media content is Bahasa Melayu, the national language of Malaysia. However, with the integration of Neural Machine Translation (NMT) technology in social media, these platforms are equipped with the tool to translate text into an array of different languages (60). The auto translation tool would help the social media posts by UMMC to reach a broader audience considering the diverse community in Malaysia. However, there are concerns regarding the accuracy of the translated content as participants in a study in Indonesia reported issues with translated content becoming unclear (61). This limitation should be noted when discussing social media tools and features, as the meaning and context of text and information provided for the community are important in crisis communication.

Implications and actions needed

Implications of this study highlights the importance of strategic and cohesive crisis communication planning on different social media platforms. By using CERC framework in crisis messaging strategies across different phases of the crisis, employing the tools and features in different social media platforms strategically and engaging with the audience efficiently, organisations and institutions can strengthen their crisis communication practices and mitigate the crisis in a more competent manner.

Although CERC comprehensively explains crisis lifecycles in stages and describes the ideal messaging strategies and best practices in crisis situations, CERC was not initially developed for the social media environment (34). While CERC has been adapted to use in the social media environment, by not having specific strategies tailored to be applied on the social media environment leaves a gap in the CERC crisis communication framework. As the use of social media in crisis communication is inevitable in today's

digital era, it is vital for a model such as the CERC to be revised or updated to fit the current digital communication climate. Social media provides several tools and features such as live broadcasting, increasing communication reach through hashtags, and commentary on posts that could play a vital role in crisis communication which is conventionally not available on traditional form of media. Hence, future research could dive deep into the aspect of amalgamating social media into CERC and finding methods to update and revise the model to better fit the cotemporary digital communication sphere. This would give the crisis communicators a better guidance and a direction on the application of CERC in any crisis situation on social media.

Strengths and limitations

As with any scientific research, this study is also not without limitations. The data collection of this study was conducted during the COVID-19 pandemic. With the movement restrictions and strict protocols at UMMC, researchers were unable to conduct in-depth interviews with the crisis communicators at UMMC. This limited the researchers to content analysis of social media postings by UMMC. Further studies could incorporate in-depth interviews with crisis communicators or focus group interviews to compliment the content analysis of social media postings to achieve further understanding on crisis communication strategies and perception of crisis communicators. Another limitation of this study is that, this study focused on a single health institution. Further studies are required in crisis response by health institutions and the usage of social media which involves in-depth investigations of social media crisis strategy of more than one hospital and in different crisis situation which goes beyond qualitative methodologies. As this study is solely based on qualitative means, quantifiable findings could not be produced which would provide profound results in several aspect of social media messaging such as the usage of hashtags.

However, the usage of CERC framework in this research has guided in finding inconsistencies in messaging not only in different crisis phases but also across different platforms. Furthermore, this study contributes to the wider discourse of using CERC in non-western settings. By investigating crisis communication of UMMC in Malaysia, this study provides further understanding and insights into how CERC performs when applied in a different cultural context from where it has been developed from. This supplements the growing body of scholarly research in the field of crisis communication in the

diverse and dynamic social media context.

Conclusions

This qualitative study explored the usage of Facebook and Instagram by UMMC during COVID-19 Pandemic in Malaysia while employing CERC as a framework to investigate the social media postings. Through the analysis of the social media posts and messaging strategies, UMMC's crisis response on Facebook exhibited better alignment with CERC than Instagram. However, both Instagram and Facebook could be better aligned with CERC across different phases of the crisis while maintaining consistency between the two platforms. This carries important policy implications for crisis communicators, especially for communicators engaged in health institutions in events such as the COVID-19 pandemic. This disparity between social media platform highlights the need to develop thorough communication strategies and policies based on the platform, and overall communication objectives. Such policies should emphasize consistent messaging across all communication platforms used by the institution across all phases of the crisis ensuring the messages aligns with an established crisis communication framework such as the CERC framework.

Facebook emerged as the platform utilised by UMMC to combat misinformation during the initial phase of the crisis. However, combatting misinformation was only significant during the initial phase of the crisis and it diminished in the subsequent phases. This shows the need for a consistent and sustained communication effort by UMMC in relation to combating misinformation throughout the crisis. This study also revealed that UMMC heavily relied on infographic for its messaging in different phases of the crisis across both the platforms. The usage of video and live broadcasting was only apparent on Facebook which highlights the untapped potential of Instagram as it also has video sharing and live broadcasting features. UMMC leveraged on hashtags to brand its content and increase audience reach, at the same time using the resharing feature on Facebook to share content from other authoritative sources such as MOH becoming a mediating source for credible crisis related information. This calls for policymakers to promote training programs for health communicators and crisis communicators engaging in health institutions to familiarise themselves on the effective use of social media tools such as video sharing, live broadcasting features and other untapped functionalities on platforms like Instagram. This

would empower institutions such as UMMC to maximise the potential of social media tools for crisis communication which would in turn contribute to a more comprehensive public health communication infrastructure.

Findings from this study contributes to the field of crisis communication in the era of social media and assists in expanding the limited literature on social mediated crisis communication by health institutions. By aligning crisis response to a framework such as the CERC, constructing content harnessing platform specific features and tools, while ensuring consistency and cohesiveness across social media platforms, health institutions like UMMC can emerge as a key participant in the field of crisis communication safe guarding public health.

Footnote

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