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Mobile social media as a vehicle of health communication: a multimodal discourse analysis of WeChat official account posts during the COVID-19 crisis

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The utilization of mobile communication can significantly enhance the availability and accessibility of public health information. To this end, various mobile social media platforms are recognized as multimodal discourses that can serve as powerful instruments in disseminating health-related information to a wider audience, thereby allowing for greater reach and improved health outcomes. This study retrospectively examined Malaysia's third wave of COVID-19 to decipher the visual representation of this epidemiological crisis on mobile social media. A qualitative research approach was utilized, underpinned by the visual framing concept of Coleman (2010) and the visual actor-network of van Leeuwen (2008), to analyze 280 images from a popular and Chinese WeChat official account called Weimalaysia. The analysis revealed that visuals on this WeChat official account highlight specific contents and features of COVID-19 in Malaysia during the third wave. However, no visual misinformation regarding intolerance elements was identified. The initial findings of this study demonstrate the importance of visuals as a crucial resource in public health communication. Additionally, the results underscore the significance of WeChat official accounts as a novel mobile social media platform for conveying health-related information during the public health crisis.

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Introduction

The coronavirus pandemic (officially named COVID-19 by the World Health Organization (WHO) on February 11, 2020) has wreaked havoc on a scale not seen in recent history. Since WHO announced COVID-19 as a global health crisis on March 11, 2020, various measures have been taken worldwide to minimize the risk of the virus spreading. In addition to the staggering death toll, the pandemic's economic, social, and educational disruption is devastating, with "the deepest recession since World War II" looming ahead (Richter, 2020). Undoubtedly, the unprecedented outbreak has significantly affected the daily lives of people worldwide (Chen, 2020).

Notably, the COVID-19 pandemic has highlighted the value of digital technology in the context of a public health crisis when physical interactions are constrained (Lim and Toh, 2022). Social media, specifically, has become an increasingly significant platform for disseminating information and guiding public behavior (Agrawal and Gupta, 2020). Messages produced on social media differ from traditional mass media in various ways, including communicative styles, news values, and appraisal content (Wu and Feng, 2022). Young people access a wide range of information for entertainment, promotional, and informative purposes, and as a result, are not interested in formal and "dry" information discourses (Feng, 2019a). Consequently, the concept of "social media news" has been formed to refer to information produced in mainstream media discourses, such as The Guardian, Sin Chew Daily, and many other social media platforms (Welbers and Opgenhaffen, 2019).

In addition, mobile social media, such as WeChat and TikTok, has become a crucial platform for communicating health information due to the fast-growing Internet and smartphone usage worldwide. Mobile social media is a web-mediated multimodal discourse that encompasses not only linguistic but also visual elements, both of which are crucial in constructing communication and conveying essential aspects of meaning (Feng, 2019a). It thus brings novel changes to traditional communication, the latter of which is mostly connected with official records. Importantly, mobile social media motivates more discussion on mobile discursive communication amid a public health crisis.

In the context of public health, visuals, and other multimodal elements have been shown to be effective in engaging the public and disseminating health-related information (Ang and Knox, 2020). Recent studies have highlighted the strategic use of visuals (e.g., comics, posters, websites, and newspapers) in COVID-19-related discourse to convey information effectively (Callender et al., 2020; Chen, 2020; Maier and Ravazzani, 2022; Zhang et al., 2022). Although a plethora of previous research has explored how COVID-19 is portrayed to the public in health communication and mass media (Oakey et al., 2022), little attention has been paid to how visuals are used in mobile discourse to convey public health information. Therefore, given the significant impact of the pandemic on global society, it is important to investigate the intersection of mobile social media, visual communication, and everyday life in the context of COVID-19 discourse.

To address this research gap, this study drew on critical social semiotics to examine social media representations of the third COVID-19 wave in Malaysia, focusing on the use of pictures on a WeChat official account. The primary objective was to identify the most frequently presented visual content in the selected WeChat official account and classify them into various categories according to the framed themes revealed in the visuals. This research also aimed to investigate the less-discussed connection between mobile multimodal communication and public health, in order to affirm that the proper utilization of visual aids on mobile social media platforms can disseminate diverse public health information in the context of COVID-19. By highlighting that visual communication provides a useful and innovative platform to bridge essential gaps in health literacy, this study provides evidence-based information to empower diverse communities affected by public health crises and facilitate public health advocacy during the pandemic.

Public health communication on social media. Since the World Health Organization declared COVID-19 a global health crisis on 11 March 2020, there has been an immediate need for medical resources and manpower to combat the spread of the virus, as well as a necessity to communicate the crisis and its risk to the general public. To help keep the public informed and actively engaged in the fight against COVID-19, multiple information dissemination channels have been utilized. Among the various channels, the Internet has become the primary information source regarding the COVID-19 pandemic and has undertaken the social responsibility of combatting this disease (Chen, 2020). Specifically, as social interactions continue to migrate online, communication about COVID-19 has increasingly shifted to social media platforms for both information dissemination and social engagement (Fischer, 2020).

The term "social media" generally refers to "the online technologies and practices that people use to share opinions, insights, experiences, and perspectives" (Cann et al., 2011, p. 46). With an estimated three billion social media users in 2021, social media is becoming progressively popular worldwide and has remarkable potential for knowledge sharing and networking in public health issues (De Gagne et al., 2021). Twitter and Facebook, for example, have become central to the technological and social infrastructure that allows people to stay connected and engage in conversation during the pandemic (Chen et al., 2020; Shahi et al., 2021).

In the field of public health crisis communication, healthcare workers have the power to create effective messages that improve patients' understanding of critical information. The public's perception and response to risk communication on social media platforms are crucial, especially in the aftermath of disasters, as social media has become a significant channel for individuals affected by crises to gain a more comprehensive understanding of risk conditions (Yu et al., 2021). However, experts suggest that there is a need for a more rigorous exploration of various digital media platforms (Liu, 2020; Westerman et al., 2008).

In fact, over the past decade, there has been a significant increase in research investigating the relationship between people's search for health information and digital media (Westerman et al., 2008). The evidence suggests that the rise of social media platforms presents both opportunities and challenges for users in accessing health-related information. On the one hand, social media provides a convenient and invaluable resource for quickly obtaining accurate information on a wide range of topics. On the other, it serves as a medium for spreading misinformation and fueling outrage (Brennen et al., 2021).

Recently, mobile social networking apps like WhatsApp and WeChat have garnered significant attention as platforms for seeking information about the pandemic (Garfin et al., 2020) and maintaining social connections, particularly during periods of social isolation (Nguyen and Nguyen, 2020). Additionally, mobile social networking has been recognized for its potential health benefits (Schneider et al., 2019) and its role as a coping mechanism for reducing psychological stress (Carolus et al., 2019).

The WeChat official account as a mobile communication channel. Browsing the Internet using mobile phones has become one of the most popular ways for the public to access social news

and information. In China, the most widely used social media app is WeChat (WēiXìn, micro-message), boasting over 1.17 billion active users as of the first quarter of 2020 (Wu and Pan, 2021; Zhu, 2019). WeChat offers a range of services and functions, including messaging, socialization, and mobile payment capabilities (Montag et al., 2018). One notable feature of WeChat that facilitates communication is the "WeChat official account" (also known as WeChat-Public-Account), which operates similarly to microblogs by providing text messages or visual content to users who choose to subscribe to the account (Harwit, 2016). This new functional module allows users to access various types of information by following specific public accounts (Liang and Yang, 2018). Numerous organizations, including companies, educational institutions, and government entities, have recently embraced the WeChat official account as a means of communication and engagement with target users (Montag et al., 2018). It has also become commonplace for Chinese citizens to follow WeChat official accounts, with an average of 10 to 50 accounts followed by each user (Zhang and Clough, 2020).

China has been directing its attention towards promoting WeChat in other countries. Malaysia, with a significant number of overseas Chinese residents, serves as an ideal market for WeChat's launch. WeChat first entered the Malaysian scene as a mobile-messaging app in 2012. The introduction of WeChat Pay in Malaysia was eagerly awaited due to the growing Chinese population in the country (Chua and Wang, 2019). In August 2018, Malaysia became the second country to enable WeChat Pay in the local currency. Since then, WeChat has expanded its services, encompassing a search engine, blogging site, newsfeed, and more, all integrated into one platform. It has garnered over 20 million users in Malaysia (OpenMinds, 2023), demonstrating its continued popularity in the country. This illustrates that WeChat, as an all-in-one system for daily communication, commercial activities, and social media, has gained widespread popularity among Malaysian users.

The diverse functions and features of WeChat official accounts make them a powerful genre for meaningful expression, applicable in various communicative settings and for multiple purposes. Unlike hypertextual constructions, WeChat official account posts exhibit textual linearity and adhere to a specific generic structure. Due to the unlimited virtual space and the nature of social media dissemination, these posts demonstrate distinct characteristics in terms of communicative purposes, style, and the use of multimodal resources (Feng, 2019b). To ensure reader-friendly information delivery and communication, WeChat writers/users often strategically select content and arrange it within the document's layout, maximizing the accessibility of visual information displayed on the screen. These components can take the form of text or visuals, interacting as a multimodal and semiotic system. In this manner, WeChat official accounts serve as virtual spaces for generating and displaying discursive communication via the insertion of visual images and videos alongside textual content (Ou, 2016). Readers can scroll through an entire post, forward it, and leave comments, most often on their smartphones.

Communication research has long been interested in foreign news coverage, recognizing its pivotal role in shaping the public's worldview and influencing the exchange of information. Traditional verbal content is no longer the sole means of engaging audiences; instead, the use of diverse linguistic and non-linguistic resources plays a crucial role in enhancing audience engagement (Myllylahti, 2019). Audiences now have the opportunity to engage in discursive interactions by employing a semiotic approach to examine journalistic or informational practices from a fresh perspective. As a result, social media platforms like WeChat receive increasing attention for their coverage of foreign news in the international political and

Table 1 Description of dataset.

Month	Duration of posts collected (total no. of days)	Pictures
October	29	110
November	29	103
December	28	67
Total	86	280

economic landscape. Amid the COVID-19 pandemic, for instance, social media platforms worldwide have strived to provide real-time coverage of the latest events. Thus, both WeChat and its official accounts have become valuable technological tools for disseminating health information and promoting disease prevention, especially during the pandemic.

Furthermore, information studies have increasingly emphasized the importance of visuals as independent messages that convey essential ideational, interpersonal, and textual meanings that contribute to the effectiveness and impact of information dissemination, instead of mere illustrations or specifications for linguistic text (Kress and van Leeuwen, 2006). Despite this, limited research has specifically focused on visuals in COVID-19-related communication (Brennen et al., 2021). Moreover, the value of WeChat, particularly the official account, as a visual information source for infectious diseases, remains underexplored. Therefore, this article presents a critical social semiotic analysis of the communicative value of China's WeChat official accounts as a visual source of foreign information about COVID-19 in Malaysia.

Methods

Data collection. This article conceptualizes mobile media as a multimodal genre for public health communication utilizing diverse semiotic resources. The corpus of this study consisted of 280 visual images extracted from 86 posts related to COVID-19 published on a WeChat official account called Weimalaysia (微大马). The data collection period spanned from October 1, 2020, to December 31, 2020, which corresponds to the third wave of the pandemic (see Table 1).

The rationale for selecting Malaysia's third wave of COVID-19 as the focus of investigation is due to its significance as a turning point in the country's public health landscape. This period witnessed a notable increase in cases, leading to heightened public concern and intense discussions on social media. The third wave was primarily driven by clusters in Kedah and Sabah, with Selangor also experiencing a significant rise in cases. In Sabah, the Benteng Lahad Datu (LD) cluster emerged, resulting in a sharp increase in cases starting from September 7, 2020. Subsequently, cases were traced back to the Tawau prison, approximately 150 km away, as many inmates with a travel history to the Lahad Datu police headquarters tested positive. Notably, the Sabah state election held on September 26 contributed to the spread of the virus, as many individuals returning from the state tested positive for COVID-19 (Ahmad and Pfordten, 2020).

During the initial stage of the third wave, the total number of confirmed cases stood at 14,368 on October 8, 2020. However, by December 3, the number of cases had increased by 381% to reach 69,095. This means that while the first and second waves accounted for approximately 21% of the total cases over a period of slightly less than 10 months, the third wave alone contributed to around 79% of the cases in just two months. As of December 31, 2020, there were 2525 new cases reported, bringing the total number of cases to 113,010, with a death toll of 471 (Hashim et al., 2021, p. 6).

Weimalaysia (微大马) is a popular WeChat official account that serves as a prominent Chinese-language mass media platform for providing information and news about Malaysia. Managed by a non-governmental team of knowledgeable and enthusiastic Chinese-speaking professionals from China and Malaysia, Weimalaysia offers a wide range of content, including articles, photos, and infographics, covering various topics related to Malaysia. These topics encompass news, culture, lifestyle, food, business, and leisure entertainment. The primary target audience of Weimalaysia is Chinese-speaking WeChat users worldwide who hold an interest in Malaysia, including students, tourists, investors, and individuals curious about the country. With regular sharing and posting of content, Weimalaysia has gained significant visibility and influence within the WeChat community. It has become a well-received mobile social media platform, garnering a wide circulation and attracting a large readership. As of September 2021, Weimalaysia had amassed over 350,000 followers, indicating its substantial reach among Chinese-speaking WeChat users.

Considering Weimalaysia's reputation as a trustworthy source of information about Malaysia and its significance as a platform for individuals interested in the country, it serves as an ideal research site for Chinese individuals worldwide seeking to understand COVID-19-related news in Malaysia. Like other social media accounts, Weimalaysia shares news and visual images on the pandemic that are sourced from various online platforms, including government websites and online newspapers such as Sin Chew Daily. These visual images are accompanied by proper attribution to the original sources or copyright holders, which enhances trust and credibility among the audience. Therefore, the visual images featured in this multimodal media platform are expected to provide substantial information about the COVID-19 crisis in Malaysia. Through qualitative and critical analysis of the visuals presented on Weimalaysia, this article aimed to explore how the COVID-19 crisis in Malaysia is visually depicted.

Analytical framework: visual framing and visual actor-network. The primary focus of this analysis was the social interpretation of visual depictions of this crucial period in Malaysia. To incorporate both semiotic and social aspects into the analysis, the researchers adopted Coleman's (2010) concept of visual framing and van Leeuwen's (2008) visual actor-network to examine visuals in mobile multimodal discourse. A tentative component framework was developed to guide the visual analysis in this study, as illustrated in Fig. 1. During the data analysis process, each picture was treated as a distinct visual image, even if some were originally published as statistical figures.

The critical analysis of visual framing is considered a significant perspective within social semiotic studies. Visual framing refers to the "selection of one view, scene, or angle when making the image, cropping, editing or selecting it" that "selects some aspects of a perceived reality and makes them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation" (Entman [1993] in Coleman, 2010, p. 237). Building on Entman's insights, Coleman (2010) defined visual framing as a form of framing analysis "beyond literal depictions and descriptions to probe into the explanatory and critical potentials of the visuals" (Bock, 2020, p. 1), by recognizing what "visual framing can do in the wider world beyond merely representing it" (Brennen et al., 2021, p. 4). Framing has thus emerged as a valuable academic concept for analyzing visual communication, particularly in the fields of
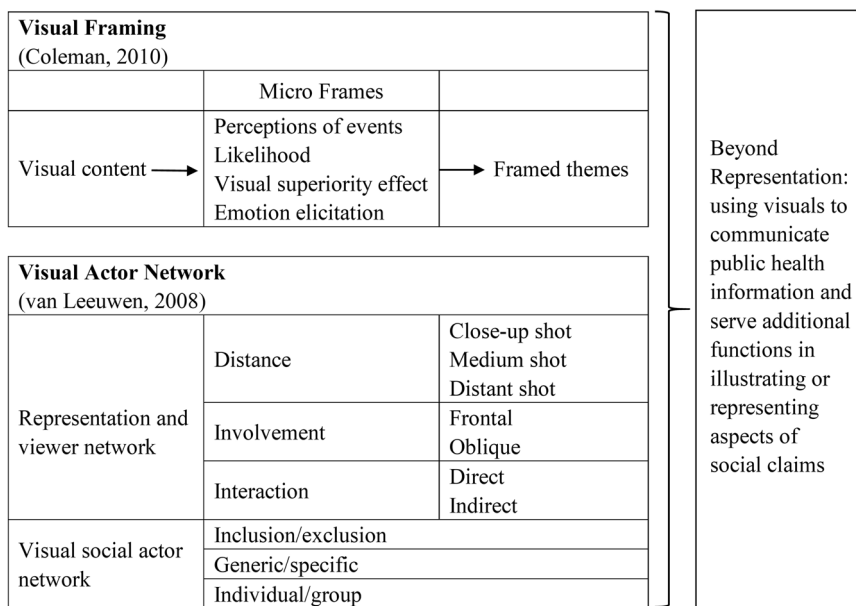
public communication, social media, and visual perception (Bock, 2020).

This study also employed van Leeuwen's (2008) analytical model of representing social actors, which has been widely utilized to investigate how interactional meaning is constructed through the symbolic visual demands presented by actors and perceived by viewers. Specifically, this visual network assists the researchers in exploring the semiotic features of images from a social perspective, revealing aspects such as social distance, social relations, and social interactions. Additionally, this network provides insights into how participants are visually depicted, including considerations of exclusion, roles, specific and generic representation, individuals and groups, and categorization (Ang and Knox, 2020). These semiotic dimensions, as illustrated in Fig. 1, should be discussed to uncover how individuals are portrayed in terms of symbolic demands, such as cinematic distance, angle, and gaze. These demands can convey ideas and create awareness among viewers by presenting meaningful real-life situations (Velu and How, 2019), as exemplified in this study within the context of public health.

Inter-rater reliability and trustworthiness of the study. The qualitative approach in social studies sometimes faces scrutiny regarding its reliability and trustworthiness (Bryman, 2012). To avoid such concerns in this study, the researchers and an invited specialist independently performed manual coding of the collected visual images. All visual images were coded based on a predefined coding scheme that encompassed various visual frames. This coding scheme was developed by drawing on existing literature on visual framing and public health communication, such as Brennen et al. (2021). Face-to-face discussions were then conducted between the researchers and the specialist to compare their coding results and reach a consensus on the identified framing themes. This process ensured inter-rater reliability and enhanced the reliability of the present investigation. To further ensure trustworthiness and credibility, a third expert in qualitative and social science studies was invited to review and scrutinize the data coding. This additional step of third-member checking added another layer of validation. The researchers also made the data collection and processing procedures explicit to ensure the entire research process was transparent and allowed for verification of the results. By establishing these measures, the study achieved substantial reliability in its findings.

Results
Visual depiction of the COVID-19 crisis in Malaysia. The 280 pictures in the study corpus were found to convey various ideas related to social activities and sentiments surrounding COVID-19 in Malaysia. Some pictures feature multiple visual elements that can signify different frames. However, for classification purposes, only the dominant communicated meanings and portrayed themes were categorized into specific frames (Brennen et al., 2021). Ultimately, a total of six prominent visual frames were identified within the corpus of 280 pictures, each containing semiotic elements and conveying different meaning potentials. These frames include authority, distress, medical efficacy, virulence, public responses, and recovery movement (as depicted in Table 2). The frames were identified by examining mise-en-scene resources, which focus on objects and symbolic elements rather than solely on human participants within the visual settings. Table 2 provides an overview of the prevalence of each frame theme, along with statistical descriptions. The following sections of the study delve into how these visual frames are symbolically meaningful in describing the COVID-19 situation in Malaysia.

Visual Framing (Coleman, 2010)			
	Micro Frames		
Visual content ⟶	Perceptions of events Likelihood Visual superiority effect Emotion elicitation	⟶ Framed themes	

Visual Actor Network (van Leeuwen, 2008)		
Representation and viewer network	Distance	Close-up shot Medium shot Distant shot
	Involvement	Frontal Oblique
	Interaction	Direct Indirect
Visual social actor network	Inclusion/exclusion	
	Generic/specific	
	Individual/group	

Beyond Representation: using visuals to communicate public health information and serve additional functions in illustrating or representing aspects of social claims

Fig. 1 Component framework design for visual analysis.

Authority. The most prevalent visual frame identified in the analysis is the authority frame, which focuses on the actions and attitudes of public authorities. Within this frame, the most frequently represented figures are Dato' Sri Ismail Sabri bin Yaakob, the Senior Minister for Security and Minister of Defence, and Tan Sri Dr. Noor Hisham bin Abdullah, the Director-General of Health. They gained prominence for their leadership in Malaysia's battle against the COVID-19 pandemic. In the visuals, they are often depicted alongside textual descriptions of government announcements related to the Movement Control Order (MCO), Recovery Movement Control Order (RMCO), international cooperation in vaccine research and development, and more. Their public service announcements serve as reminders to Malaysians to take preventive measures against the spread of COVID-19.

Based on van Leeuwen's (2008) visual actor-network, these authoritative figures are predominantly depicted as individuals rather than as a group. However, the visuals include the national flag and emblem of Malaysia (Fig. 2), which, despite being in the background, associate them with a particular social identity through stereotyping (i.e., Malaysian). This connotes national unity and collective effort in addressing the public health crisis. Notably, there is an absence of other participants (i.e., citizens), symbolically excluding them from the visuals. The citizens are not portrayed as the main actors or characters in images related to authority. This suggests that citizens are positioned as recipients of specific actions from the authority. For example, government officials serve as the primary figures for delivering speeches, while citizens passively receive their speeches.

The visuals also predominantly feature close-up shots with frontal or slightly oblique angles, emphasizing the facial expressions and upper body actions of the depicted figures. This draws viewers' attention to their involvement. The frequent use of eye-level representations implies an equal power relationship between the viewers (i.e., Malaysian citizens) and the depicted individuals (i.e., government leaders). The figures typically gaze indirectly at the viewers, presenting serious, unsmiling facial expressions or masked faces, and employing finger gestures. These elements convey their expectations for viewers: a serious and conscientious response to the pandemic.

The corpus also included visual representations of other public authorities in Malaysia. These authorities are depicted through their spokespersons or representatives, as well as objects that symbolically identify them (e.g., state flags, official notices). This type of visual frame was predominantly observed in speeches delivered by these leaders. The role of leaders is crucial, especially during times of crisis, as their engagement with the community often has a lasting impact on the acceptance of information (Perumal et al., 2022). In the face of a social crisis like COVID-19, the central government is expected to take the lead in addressing the citizens, while other authoritative agencies provide support. The collaborative efforts of different authorities in Malaysia demonstrate how joint cooperation can effectively combat the public health crisis of COVID-19 while also combating the spread of misinformation. The visual frames of government speeches thus serve as explicit affirmations of the authority of public authorities. Trusted individuals in the context of social media platforms enhance the perceived legitimacy of the information being disseminated.

Distress. The second most prevalent frame observed is the depiction of distress. In this frame, the pictures create a sense of being in danger and in need of urgent help, triggering emotions of upset, worry, anxiety, and more among viewers. As indicated in Table 2, two main themes contribute to this distress: lockdown/movement control/quarantine (43.04%/$n = 34$) and economic depression (29.11%/$n = 23$). These epidemic-related conditions raise significant concerns among the Malaysian public.

The information regarding lockdown/movement control/quarantine is often represented through narrative-driven visuals or official notices. Human characters, such as police officers carrying weapons, and objects symbolizing movement restrictions, convey various ideas related to social "restriction" or freedom "deprivation". The police or responsible individuals are typically depicted as a generic group, exhibiting features such as protective suits and engaged in similar actions (as shown in the left picture in Fig. 3). Additionally, medium and far shots with oblique angles at eye level are commonly used to depict lockdown-related events. These visual techniques convey a sense of detachment or exclusion, indicating that the depicted participants or events are not closely connected to the shared world of the audience (van

| Table 2 Visual frames identified in public health communication during the COVID-19 pandemic.							
Frame	**Description**	**Example**	**Freq.**	**%**	**Microcontent**	**Freq.**	**%**
Authority	Actions or attitudes of governmental/public authorities	As shown in the right image of Fig. 2	87	31.07	Government spokesman	63	72.41
					International cooperation	9	10.34
					State government	4	4.60
					Head of State of Malaysia	2	2.30
					Higher education institutions	2	2.30
					Department of Religious Affairs, Malaysia	1	1.15
					Shopping mall official notice	1	1.15
					Malaysian Medical Association	1	1.15
					Exhibition Bureau	1	1.15
					House of Commons meeting	1	1.15
					Department of Islamic Development Malaysia	1	1.15
					Chinese chamber of commerce	1	1.15
Distress	Psychological or social distress associated with the pandemic and suppression consequences	As shown in the left image of Fig. 3	79	28.21	Lockdown/movement control/quarantine	34	43.04
					Economic depression	23	29.11
					Distress condition (bleakness, etc.)	9	11.39
					Foreign employees	4	5.06
					Transportation	3	3.80
					The variant of the virus	2	2.53
					Postal service	1	1.27
					School	1	1.27
					Homeless	1	1.27
					Illegal immigrant	1	1.27
Medical efficacy	Offering medical information, highlighting tests, vaccines, equipment, etc., suggesting cures, treatments, or preventatives for the virus	As shown in the top-left image of Fig. 4	66	23.57	Testing	40	60.61
					Vaccine	14	21.21
					Disinfection/sterilization in public environment	3	4.55
					Medical equipment	3	4.55
					Pharmacy/hospital	3	4.55
					Treatment	3	4.55
Virulence	Indicating updated information about infectivity and reported cases	As shown in the right image of Fig. 5	35	12.50	Increase of infected cases	24	68.57
					The graphical representation of a virus	11	31.43
Public responses	Public attitudes towards the pandemic, e.g., social distancing, and lockdowns	As shown in the top-right image of Fig. 6	23	8.21	Cooperation	18	78.26
					Non-cooperation	5	21.74
Recovery movement	Measures and efforts related to economic and everyday-life recovery	As shown in the right image of Fig. 7	14	5.00	School	2	14.29
					Transportation	2	14.29
					Trip/hanging out	2	14.29
					Economy	2	14.29
					Lift movement curbs/ liberalize MCO	2	14.29
					Social activities	1	7.14
					Daily life	1	7.14
					Religious activities	1	7.14
					Panoramic view of KL	1	7.14

Freq. = Frequency.

Leeuwen, 2008). This photographic strategy does not seem to encourage viewer engagement but rather reinforces a sense of social isolation, which often results in psychological impacts such as distress and uncertainty.

On the other hand, visuals depicting economic depression typically exclude human participants. These visual representations encompass various sectors, including the airline industry, hotels, offices, tourist attractions, shops, malls, and restaurants, all of which are affected by the economic downturn. In Fig. 3, the Robinson Mall is captured in the right picture. As one of Malaysia's most renowned shopping centers, it is depicted as vacant, devoid of customers, and ultimately forced to close its doors. This visual portrayal communicates the message of a "depressed economy during COVID-19", resonating with the rising unemployment rate and economic uncertainty in Malaysia. Similar to many countries grappling with the pandemic, Malaysia has experienced a significant number of job losses, intensifying financial pressures, and exacerbating stress and anxiety among

Fig. 2 Visual depictions of *authority*: government spokesman.
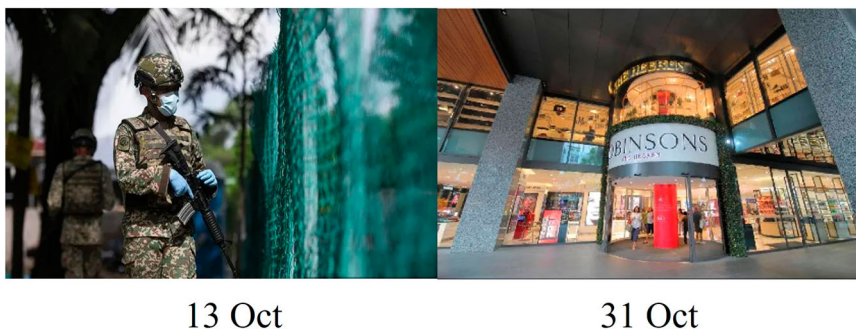
Fig. 3 Visual depictions of *distress*.

citizens. Furthermore, COVID-19-related challenges in Malaysia, such as disruptions in transportation, the emergence of new virus variants, and issues concerning foreign employees and illegal immigrants, further amplify the impact of the pandemic. However, it is worth noting that, unlike earlier studies on crisis communication, the visual portrayal of COVID-19 in Malaysia tends to present a lower level of perceived "risk", since the inherent hazards and resulting outrage—two crucial components of risk communication in social media (Malecki et al., 2020)—are not explicitly depicted or evidently perceived by audiences.

Medical efficacy. This is another prevalent visual frame, accounting for more than one-fifth (23.57 percent) of the visual information analyzed. Within this frame, the majority of examples convey positive, helpful, or hopeful meanings, suggesting the existence of preventatives, cures, or treatments for the virus. The primary content associated with this frame revolves around healthcare workers and medical staff who are involved in COVID-19 testing services, such as nucleic acid testing (60.61%/$n = 40$), as indicated in Table 2. In Fig. 4, the top-left picture represents healthcare workers, often portrayed as a group rather than individuals, using a distant and oblique angle shot. In most instances, viewers are indirectly presented with the medical actions of these healthcare workers. This approach keeps the audience at a distance, both literally and figuratively, creating an objective perspective of the "effective" and "orderly" measures taken to combat the virus and save lives. Additionally, some healthcare workers and medical staff are depicted in close-up bust photos (top-right picture in Fig. 4), emphasizing their hand actions and testing kits. The inclusion of medical protective clothing in these frames serves to depict healthcare workers in a generic and professional manner, highlighting their commitment to safety.

Vaccine-related pictures account for 21.21% ($n = 14$) of the visuals within the frame of medical efficacy. As seen in the bottom left image of Fig. 4, this type of picture commonly features a vaccine vial and syringe, accompanied by explicit text such as

"COVID-19" and "vaccine". The symmetrical arrangement of verbal elements (coronavirus COVID-19 at the top layer) and visual elements (vaccine vial and syringe at the bottom layer) establishes a connotation of "close interrelation". This mixed design carries semiotic implicatures in communication. Firstly, the association between the font size and prominence (visual power) of the typographical words is based on a general cognitive understanding that larger font sizes indicate greater prominence or power. The foregrounded "vaccination" action and the medium-sized "vaccine" further create an iconic association of "challenging the overwhelmingly powerful image of COVID-19". The close-up shot and the presence of human hands/figures, albeit minimal, emphasize the implied focal message of "the imminent vaccine hopefully protecting individuals against the infection". Additionally, medical efficacy in Malaysia is portrayed through other effective actions, such as the disinfection and sterilization of public amenities, as well as the provision of medical equipment and treatments, as shown in the bottom right image of Fig. 4.

Virulence. Virulence is represented in 12.50% of the visual corpus. The majority (68.57%, $n = 24$) of visual depictions within this frame portray the spread of the virus as "worsening", illustrating the increase in infected cases through contour maps (national or regional) painted in bright colors (see left visual in Fig. 5). Statistical diagrams are also used to present information on the number of confirmed cases. These visuals convey the message that the virus is still spreading in Malaysia, emphasizing the need for continued public attention. Around 31.43% of the visuals within this frame consist of graphical representations of the coronavirus, exhibiting varying degrees of abstraction and stylistic preferences. Despite their individual idiosyncrasies, these visual depictions share common characteristics that aid in easy recognition for viewers. For instance, in the right picture of Fig. 5, the viruses appear more concrete than abstract. These icons are primarily created to convey the message that viruses are germs, inherently unpleasant, dangerous, and in need of careful prevention.

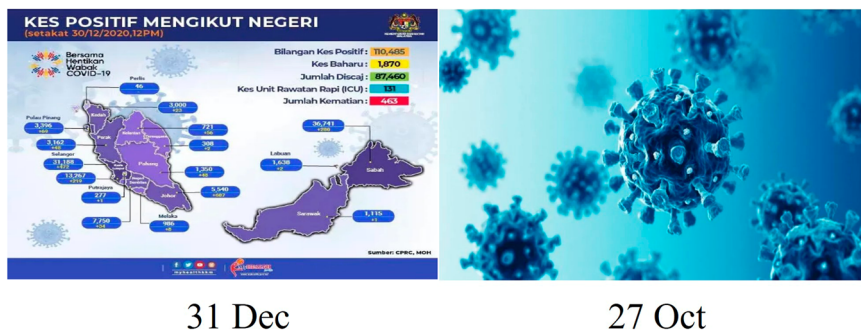**Fig. 4** Visual depictions of *medical efficacy.*

Fig. 5 Visual depictions of *virulence.*

Public responses. Public responses play a significant role in Malaysia's efforts to combat COVID-19. Despite the imposition of drastic lockdown policies or MCOs, these measures are generally positively understood by the majority of citizens. The effectiveness of such mitigation measures in a public health crisis relies heavily on the cooperation and compliance of society members. The attitudes, knowledge, and practices held by citizens regarding COVID-19 are indeed crucial in determining a society's readiness to implement intervention plans and follow guidelines from health authorities.

In Malaysia, citizens generally display positive responses to measures aimed at containing the spread of the disease. A majority proportion of 78.26% ($n = 18$) of pictures depicting public responses showcase cooperation among the people, such as wearing face masks in public (limiting the spread of the virus) and maintaining social distance by lining up in an orderly manner (top-row pictures in Fig. 6). However, there are a few pictures (22%, $n = 5$) that show non-cooperative attitudes, such as the bottom picture in Fig. 6. In this image, only one lady is seen wearing her face mask inappropriately among a crowd on the street, violating regulations. The use of a relatively distant shot blurs the lady's face, weakening the emphasis on criticizing her attitude. Other pictures highlight violations of non-compliance with MCOs. While these strict rules effectively minimize the risk of virus transmission, they may be misunderstood by some

citizens and perceived as inaccessible or even hostile. Therefore, visuals depicting non-compliance or delinquent behaviors towards preventive measures and MCOs are also present. Even so, the majority of visuals showing cooperative attitudes indicate that these efforts have been effective. As a result, citizens tend to demonstrate a moral obligation to comply with the measures and place trust and confidence in the government's actions.

Recovery movement. Despite the numerous challenges posed by COVID-19 in economic and social domains, Malaysia is showing promising efforts to recover, rejuvenate, and reform itself. The recovery movement encompasses various aspects of people's social lives, including socializing (depicted in the left picture in Fig. 7) and education (depicted in the right picture in Fig. 7). These instances account for two occurrences or 14.29%, respectively, as shown in Table 2. Meanwhile, religious activities and other daily-life-related engagements are depicted minimally (at 7.14%/$n = 1$, respectively). The participants in these images are represented generically by wearing face masks, symbolizing the collaborative efforts of citizens in promoting the recovery movement. These visuals signify that the government has implemented several strategies to foster determination, resilience, and the gradual return to normalcy, particularly during the final stage of the third wave of COVID-19 in 2020.

Fig. 6 Visual depictions of *public responses*.

Fig. 7 Visual depictions of *recovery movement*.

Functions of visuals and WeChat official accounts in public health communication. It is worth noting that visuals often serve multiple functions simultaneously, rather than exclusively fulfilling a single purpose in conveying information about the pandemic. Based on the findings, two prominent communicative functions were identified in visual presentations related to COVID-19 discourses. Through a primary qualitative analytical perspective, the researchers categorized these functions based on dominant framed themes and potential meanings, as demonstrated above.

Visuals are primarily employed to illustrate the information presented in corresponding discursive messages. In this process, specific features or core information are selectively highlighted, capturing the attention of the audience. In most cases, visual images provide a clear representation of the central aspects of the textual claims, enabling the audience to quickly grasp the intended message. Accordingly, the visuals used in the WeChat official account serve as concrete evidence supporting informative claims. In other words, the pictures function as a means of "fixating evidence", where images are utilized to substantiate beliefs (Amann and Cetina, 1988). This evidentiary function attributed to the images often relates to how the world (in this case, the COVID-19 pandemic) is visually depicted. This direct connection to the world is also referred to as the "indexicality" of visual resources.

Previous scholars have argued that visual resources used in web-mediated discourses serve the purpose of attracting readers' attention and enhancing their perception of information. According to Vaccari and Chadwick (2020), "visuals enhance the transmission of information by helping people to establish and retrieve memories……" and that "individuals process visual information more directly and with less effort than verbal information" (p. 2). An illustration of this can be seen in Fig. 7 (right side), where the primary message sourced from a Chinese newspaper in Malaysia is conveyed through verbal text superimposed at the center of the image, stating, "新学年的开课日维持在2021年1月20日" (the start day of the new school year will be January 20, 2021). The Chinese-language message and the visual content work together to reinforce the key information of the entire news report regarding the "start day of school", utilizing vivid-colored images and contrasting colors for emphasis. Even without textual messages incorporated into the images, audiences are still capable of comprehending the intended information. Many visuals are therefore employed to attract attention while supporting the producers' claims about the central information. For instance, an image depicting a vaccine vial may suggest the effectiveness of vaccinations in preventing COVID-19 infection.

Moreover, visuals serve the dual purpose of eliciting emotional responses in audiences and framing messages to empower them. This empowerment, as suggested by Lakoff (2010), enables

individuals in society to be aware of how they should act in response to requests. Consequently, socio-cultural communication often involves appealing to appropriate social norms to facilitate emotional and behavioral responses from audiences (Hyland-Wood et al., 2021). Visual communication, therefore, needs to consider both the practical and psychological aspects of eliciting desired responses, including the audience's ability, opportunity, and motivation to engage in recommended actions. In this particular study, communicators were observed to utilize themed pictures to promote desirable social norms, framing both descriptive norms (showing individuals engaged in desired behaviors, such as highlighting medical efficacy and cooperative public responses) and injunctive norms (conveying that certain actions are the right thing to do, such as getting vaccinated) (Schultz et al., 2007). Audiences are then intrinsically motivated to foster their civic engagement, which includes reinforcing shared values and avoiding becoming disease vectors during this pandemic (Jordan et al., 2021).

The mobile media platform used in this study, specifically the WeChat official account, aims to communicate messages of solidarity and optimism in a subtle manner (Gong et al., 2022). Solidarity in this context refers to the agreement and support among members of a group. During a public health crisis, this alignment and support can come from various sources and involve diverse social groups. In fact, through visual images, both at the authoritative and public levels, this study portrays connotations of "steadiness" and "harmony" by highlighting governmental responsibility, preparedness, and public cooperation, among other factors.

While distress is visually framed as "silent" and "depressed" in this study, extreme and uncontrolled behaviors were not depicted visually throughout the three-month period of the third wave of COVID-19. The people portrayed on the WeChat official account tend to exhibit patience and self-restraint rather than resorting to violence, attacks, hysteria, or psychological trauma as responses to the pandemic in their community (Abdullah, 2020; Malecki et al., 2020). The visual framing employed in this study rhetorically softens the sense of panic, potentially reducing anxiety. By emphasizing "calmness" and "optimism" in visual framing, the intention is to reinforce the idea of being in the process of recovery. Overall, visuals used in crisis communication have the potential to foster a shared belief in togetherness and encourage audiences to set aside their differences and come together with a heightened sense of collective responsibility (van Zomeren et al., 2008).

Conclusion

Previous studies have consistently demonstrated the essential role of mobile media in disseminating information related to public health issues. In line with the extant literature, the present study employed a social semiotic approach to conduct a qualitative analysis of the visual discourse of COVID-19 in Malaysia on mobile media.

The WeChat official account, with its vast user base of over 1.17 billion active users, plays an essential role in the timely distribution of updates regarding the number of COVID-19 cases, virus spread, and preventive guidelines. WeChat users frequently share this information with their family and friends, thereby increasing awareness of the pandemic and the importance of adhering to preventive measures. In this study, Weimalaysia was found to utilize a combination of texts, visuals, and storytelling to deliver engaging and memorable content during the crisis. These formats include authoritative messages, demonstrations of medical efficacy, public responses, and depictions of recovery movements. Such science and crisis communication not only reduces

the risk of transmission but also promotes public health campaigns, such as handwashing and mask-wearing while providing mental health resources for those affected by the pandemic. Overall, WeChat official accounts serve as vital channels for disseminating health information to billions of active users and beyond. Given the increasing popularity and effectiveness of WeChat official accounts in Chinese-speaking societies, it is crucial to recognize them as valuable tools for health communication that warrant more attention.

Furthermore, the findings highlight the potential role of visuals in shaping public beliefs and understanding of the world. Visual images utilized on mobile social media platforms, such as the WeChat official account, are widely employed to convey relevant information regarding the COVID-19 situation in Malaysia. These visuals selectively emphasize specific aspects of the pandemic crisis in the country. It is worth noting that misinformation and disinformation are not exclusive to the current coronavirus pandemic, as they have been present since its initial emergence (Brennen et al., 2021). The spread of misinformation regarding COVID-19, particularly on social media platforms in other countries, has been increasingly observed. However, visual misinformation that promotes "intolerance", such as racist, xenophobic, or extreme partisan elements, is not found in these visuals pertaining to COVID-19 in Malaysia.

Semiotic resources are always useful in communicating information. Here, they help elucidate and frame people's understanding of the crisis while establishing the authority and authenticity of information. Therefore, this study was based on the understanding that mobile media offers distinct advantages in disseminating crucial information, sharing diagnostic treatments, understanding global conditions, combating misinformation, and reducing anxiety during a public health crisis. The findings of this study underscore the importance for scholars and specialists involved in public health communication to recognize the valuable role that visuals play. While this study qualitatively examined the third wave of COVID-19 in Malaysia over a three-month period, it should be noted that the research design has limitations in exploring the long-term process in depth. Future investigations are thus recommended to adopt longitudinal perspectives to examine the relationship between mobile media and public health communication over different periods and in various social circumstances, especially considering that the threat of the coronavirus persists. Finally, this study seeks to inspire further research using corpus-assisted approaches or interviews to delve into public responses to health crisis communication in more detail.

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