

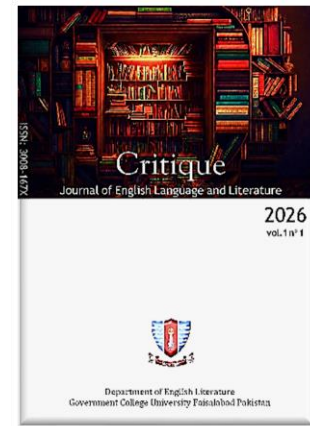
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Postdigital Health Communication in Graphic Medicine: A Multimodal Discourse Analysis of World Health Organization Infographics about COVID-19

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ABSTRACT

In the postdigital age, organizational ways of communication have altogether changed. COVID-19 was a global problem which needed the dissemination of health information at the global level. World Health Organization (WHO) used infographics disseminated through digital media to communicate public health information during COVID-19 to audiences across the world. However, the effectiveness of the medium of infographics as health communication has not been measured. Using Kress and van Leeuwen's visual grammar within the framework of Graphic Medicine, the present study aims to analyse the effectiveness of the medium of WHO's COVID-19 infographics in the communication of public-health awareness. Kress and van Leeuwen's multimodal discourse analysis method ascertains communicative effectiveness by viewing how these infographics fulfil the requirements of graphic health communication. It has been found that WHO communicated public health information through multimodal discourse of infographics in an effective and efficient manner. WHO infographics employ representational human figures, varied skin colours, and accessible visual cues to promote inclusivity, while captions effectively anchor the polysemous nature of visual elements to guide viewers towards the intended interpretation. The study argues that infographics used by WHO enact an inclusive visual health communication that even the people with limited proficiency in English are able to understand key public health information. The study is significant because it shows how health professionals may effectively use visual communication to convey health messages to the public.

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Introduction

Digitalization has revolutionized the way we interact with one another. It has also changed the mode of information through which we are advised to take safety measures during public emergencies such as COVID-19. World Health Organization (WHO) employed digital media including their website, Twitter handle, Facebook page and television channels for the awareness of the public during the COVID-19 pandemic. Comics in the form of infographics have also been extensively used by WHO to advise the public as well as doctors on how they can protect themselves and others and break the spread of the pandemic. The pandemic knew no boundaries despite the presence of and talk about

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borders, quarantines, and social distancing. It was a universal phenomenon. Blumczynski and Wilson remark that the etymology of the word pandemic has a tension in it: pan means all (humans) and this implies that the virus does not know any national borders and localities and demos means people or peoples whom pandemic “affects ... in all their cultural, ethnic, religious, linguistic and political diversity” (Blumczynski and Wilson 3) and it must be tackled globally and “centrally by the World Health Organization” (Blumczynski and Wilson 3). Hence, it was the duty of a global organization, such as WHO to issue guidelines and measures to be followed by people across the globe.

It was further noted that during the pandemic, not only verbal language but also visual forms were used in online health communication. The purpose was that such media may be understood across cultures, communities, ethnic and racial groups, and countries through the internet as a global digital medium. Infographics used by WHO are also a form of visual language encoded to disseminate its message to all across the globe. Graphic Medicine provides a useful lens to analyse visual infographics within the Medical Humanities.

In Medical Humanities, Graphic Medicine stands at the interface of comics and healthcare. Czerwiec et al. define graphic medicine as “the intersection of the medium of comics and the discourse of health care” (1). Written in the form of comics, the book asserts that comics are a form of potential energy (Czerwiec et al. 7). Once uploaded, they keep spreading on their own. They assert that Medical Humanities and disability studies draw on a range of visual narratives and comics; hence, the study analyses WHO visual infographics in promoting awareness of the public regarding protection and prevention during COVID-19.

The term ‘Medical Humanities’ like Yeats’ famous phrase “terrible beauty” (Yeats 180) is an oxymoron and poses difficulty for those who encounter it for the first time. It was George Sarton, a historian, who used term ‘Medical Humanities’ for the first time in 1948 (Errington). Medical Humanities rose in the UK and the US separately. In the US, Pennsylvania State College of Medicine opened the first Department of Humanities in a medical university in 1967. In the UK, there was a drive to reintroduce medical ethics into medical education through such forums as the London Medical Group. Anne Whitehead and Angela Wood note that “medical humanities ... names a series of intersections, exchanges and entanglements between the biomedical sciences, the arts and humanities, and the social sciences” (Whitehead and Wood 1). It was observed that medicine and humanities had a great potential for bridging the divide between science and technology and could solve the issues of the culture on the other (Engelhardt 238). Medical Humanities has enhanced the scope of humanities by repositioning them “to leave their isolation and speak again to the broad concerns of our cultures” (Engelhardt 239). COVID-19 was a common concern of all cultures for which much was contributed by the Medical Humanities scholarship.

However, Medical Humanities scholars may take advantage from the scholarship and findings of digital humanities in the postdigital era. It has been observed that “the postpandemic programmatic reflections include “a call for a systematic attention to digital environments” (Pietrzak-Franger 1). In fact, a little has been said about the use of a particular digital mechanism in the processes of knowledge production and dissemination in postdigital times. There is a need to augment and move beyond the communication carried through only narratives in the field of medicine and focus the alternative ways of conveying health information. In this connection, Digital Humanities may be mobilized for the assistance of Medical Humanities.

Literature Review

A large corpus of studies is available on the use of narratives and comics in the health and medicine related communications, especially, about COVID-19 pandemic. Langum and walker report that the Facebook posts shared by people showed that they were involved in reading *The Decameron* by Boccaccio and other pandemic novels during COVID-19 period (2). The reality is that under such surreal times, literature has something to do with the crisis. The researchers remark that the literature about bibliotherapy, and the use of literature to treat illness is increasing at a high rate. Furthermore, the pandemic drew attention to the nuances of language, and metaphors of war that have been developed to convey the sense of emergency and crisis. Words such as ‘war zone’ and ‘frontline soldiers’ were used for hospitals and doctors respectively. However, language was also involved in COVID-19 related communication through translation.

Another study focused on Translational Medical Humanities and its role in bridging the gap between medical academic scholars and general public (Ostherr 529). Kirsten Ostherr argues that by responding to the communication needs in the COVID-19 crisis, translation is already responding to the ever-increasing needs of the field. This study has also broadened the definition of translation. Hence, he remarks that “the concept of ‘translational humanities’ should be understood as a method for improving health, both by expanding the definition of ‘health’, and by balancing the technological and biomedical responses to the crisis” (Ostherr 530). Furthermore, the projects of Translational Medical Humanities can cross the narrative gap by combining artistic shapes of data visualization with historical or personal stories that provide background specificity and affective or aesthetic signs. However, verbal mode was not the only mode of COVID-19 related communication, visual language, especially, comics were also used at a large scale to convey the health information.

Another prominent researcher, Sarah McNicol, focuses on the role of comic books in the health communication and comments that the comics do something more than transmitting health information. They help the readers empathize with the mental and social conditions of patients (McNicol 50). The researcher argues that not only the results of testing but also the reactions of friends and family may be represented through comics. Further, she argues that erroneous beliefs may also be eradicated through the interplay of characters, where one character puts forth such belief and others contradict it. The visual component and the element of humour make the facts memorable in comics. A question arises: can medical narratives be put in comic book form?

Using the principles of narrative medicine, Williams sought answer to the question whether comics and graphic fiction may be utilized as a resource for patients, caregivers and health professionals (Williams). Various comic narratives are analysed taking them as examples of Graphic Medicine. He further argues that graphic narratives pose some complicated issues of the nature of fictiveness and truth in them (Williams 26). The writer develops the persona different from his own personality so that his peer cannot find exact equals in the narrative. Self-reflexivity is also used in graphic narratives in which the creation of comics within comics is shown. These autobiographies and the problems related to them enlighten the healthcare professionals and “may lead to a more considerate and enlightened attitude when dealing with the patient’s history” (Williams 26) which is considered a poor and contradictory history on the part of the patient. It has also been found that the medium of comics is appropriate for the depiction of subjective experiences of the suffering and illness and it can enhance the education of healthcare professionals as well as the public.

Comics and the medium of graphics may also increase the empathy in doctor-

patient relation. John Rosswell Cummings analyses Graphic Medicine in the forms of medical narratives and comics and uses the semiotic model of Kress and van Leeuwen to discover to what extent they create empathy in the doctor-patient relationship (Cummings). He observes that the detached concern is a big flaw of medical profession and there is a need for the cultivation of the empathetic approach. By analysing the key themes in four different comics, the researcher finds that empathy has been emphasized in all these comics. The vitality of human experience and the significance of bearing witness have also been recognized (Cummings). Furthermore, the detached concern of the medical professionals has been criticised.

Comics were used in online learning during COVID-19 pandemic. Very Hendra Saputra and Donaya Pasha carried out a research project on development and use of comics in online learning during this period. They found that comics not only provide stimulus to teachers but also are a means of learning for students in the classroom as well as at home (Saputra and Pasha). In comparison, children find it difficult to learn from apps and their parents are unable to help them in this regard. Moreover, comics developed in the JPG and PDF formats may be efficiently used in online and offline modes.

This use of comics for learning was studied through various other angles. Insar Damopolii et al. studied the impact of the use of comics in learning on the cognitive learning outcomes of students. The students were given comic assisted and non-comic assisted data to learn, and they showed greater learning outcomes with comic assisted input. They therefore recommended “that d-comics can be an alternative source of learning for students during the COVID-19 pandemic” (Damopolii et al. 43). Hence, improved results may be achieved by using comics in online learning.

Furthermore, the research explored the connection between public health and visual arts, particularly graphic novels in connection with COVID-19. Catherine Ma et al. conducted an online survey to collect data from the children in New Zealand about what is their favourite place in the neighbourhood (Ma et al.). Based on it, they developed recommendations to write a graphic novel and afterwards produced it. They aimed to “explore what aspects of children’s neighbourhood environment supported their wellbeing” in the COVID-19 lockdown period (Ma et al. 7). The output of the project was a graphic novel and its audio version which were made freely available online, and the article reported both the findings and the product of this endeavour. The study made the perspectives of participants accessible to others through various media.

Likewise, Hamaguchi et al. studied the dissemination of validated information through infographics in the fast-evolving ecology of false news during COVID-19. Their focus was on how fast the validated infographics and other tools of visual communication transmit information on correct public health measures during COVID-19 lockdown. They created and transmitted this information through social media in twenty languages for global audiences. They found that visual language such as infographics may be a valuable currency in the economy of public health communication (Hamaguchi et al. 485). Further, it has the potential to fill the gaps in public health education and make the citizens more responsible in sharing information about COVID-19 (Ma and Langridge).

Visual language and comics were used to communicate social skills and coping strategies in COVID-19 period. Muhammad Rais et al. studied the effect of digital comics, especially, self-regulation and self-awareness comics on the social skills of students of elementary level. For them, self-awareness means “the positive response to being aware of obeying the covid-19 prevention protocol” (Rais et al. 181), for example, being conscious of wearing masks, frequently washing hands and using personal utensils. On the other hand, self-regulation, in the context of COVID-19, “is related to students’ awareness to

obey the rules to wear a mask, wash their hands, and other healthy acts to stop the spread of the virus, especially at school” (Rais et al. 181). Using quantitative methods, they found that both self-awareness digital comics and self-regulation digital comics increase the life and social skills of students regarding COVID-19.

Another study conveys that comics were used effectively for public awareness during COVID-19 pandemic. Ciléin, Kearns and Nethmi Kearns remark that for a mass scale shift of behaviour during the COVID-19 crisis, there was a great need for the large-scale awareness of the public. Governments and other health bodies including media companies found an effective medium of communication in the form of comics. They argue that due to their dual coding, comics increase the comprehension and memory of the readers due to visual and verbal elements. Furthermore, comics also have a symbolic element along with direct realistic reflection that they perform. The use of comics in symbolic sense “allows abstract concepts to be made tangible, such as by showing how coughs spread clouds of infective material that are invisible in life, and by representing the presence of infection” (Kearns and Kearns 2).

Another way of concrete representation is metaphor which makes the ideas clear and memorable such as ‘isolation bubble’ and ‘tsunami of COVID’ clearly convey the ideas of social isolation and arrival of a catastrophe. The researchers argue that scientific concepts may be communicated in an engaging and memorable manner using comics which combine the powers of text, visuals and narrative. In the same manner, Sweetha Saji et al. remark that comics respond to and document the ways we deal with pandemics and crises (Saji et al. 136). They focus on the COVID-19 comics in the form of cartoons used on the Graphic Medicine website and analyse by using theories of Medical Humanities. Comics make a collective response to the pandemic by constructing metonyms, metaphors and symbols. They contend that “anthropomorphic metaphors used in the COVID-19 comics capture the existential experiences of the self and the bestial nature of the virus; the superhero metaphors endorse health-care professionals who are engaged in minimizing the spread and impact of the virus” (Saji et al. 152). Furthermore, the graphic story of COVID-19 is replete with the metaphors of conflict and war; however, they convey the sense of shared understanding and common target.

Overall, it may be observed that no study explored the WHO infographics as a tool of Graphic Medicine to communicate public health messages fully. Therefore, this study aims to analyse WHO infographics using the theory of Graphic Medicine and the method of visual grammar as given by Kress and van Leeuwen.

Research Methodology

Medical Humanities as a field of study lays stress on the value and role of traditional humanities and social sciences in responding to the broad range of problems and questions concerning human health and illness (Gilman xi). It has much to do with the education and training of health professionals in public health, medicine, dentistry and nursing. Thomas R. Cole et al. define Medical Humanities as “*an inter and multidisciplinary field that explores contexts, experiences, and critical and conceptual issues in medicine and health care, while supporting professional identity formation*” (Cole et al. 7 italics in original). Other disciplines that help medicine and healthcare are traditional humanities and social sciences. Due to such fields as Medical Humanities and Bioethics, there has been a great shift from medical reductionism to medical holism. The patient is not seen as an illness or disease only but as a whole person who has all facets of his personality active. Medical Humanities bridge the gap between sciences and human experiences and add the social and psychological dimension to medicine and healthcare.

Moreover, it may be observed that arts have also been wedded to sciences through Medical Humanities. Literature, music and visual arts make health and medicine their subject matter and provide means of clear comprehension to the health sciences. Health Humanities is a later term that accepts interdisciplinarity in a more democratic way and focuses on the contributions of those who are marginalized in Medical Humanities such as allied health professionals, patients, nurses and caretakers. Hence, mental healthcare has been connected to the humanities in an additive and integrative manner (Crawford et al. 5). Mental healthcare basically provided the site of inclusivity of the marginalized because many methods of treatment here are not medicinal.

Graphic Medicine is the sub-domain of Medical Humanities. Graphic Medicine is the meeting point of comics and healthcare. The framework of Graphic Medicine has been laid down in *Graphic Medicine Manifesto* (Czerwiec et al.). It is an interdisciplinary area of study and an approach to healthcare education in which principles of narrative medicine are combined with an exploration of the visual medium of comics. The authors assert that “[c]omics give voice to those who are often not heard” (Czerwiec et al. 2). It gives more inclusive perspective to healthcare, medicine, caregiving, illness and disability.

Graphic Medicine gives equality to multiple subjects and differing points of view and experiences. It explores the myriad ways in which health and disease may be represented using graphic form. In medical classrooms, stress is laid on the use of comics to communicate ideas. Graphic Medicine is a collaborative effort in which healthcare teachers, professionals, professors of literature, cartoonists and many others take part. Their work is concerned with text as well as space. It is all about creativity and the use value of comics in communication.

Comics are like potential energy which does not need any external force to move them. Different people having different interests join together to talk about comics in new ways. They assert that in Medical Humanities “there is a wonderful array of comics to choose from that address illness, disability, and caregiving” (Czerwiec et al. 8). It has also been found that in healthcare, many ethical issues are caused by poor communication.

The authors also observe that the comic artists play with the medium of communication and the medium of comics plays with our perceptions creating an enthralling and fluid experience (McCloud; Czerwiec et al.). Whatever the subject matter, we do have enjoyment while reading comics. Furthermore, Al-Jawad and Czerwiec remark that comics are necessarily and quite obviously “constructed narratives” (82). Text, visual, speech, and elements of narration can all be consciously created and studied. Comics do have visual elements to be analysed, too. They contend that “gutters, symbols, colour, thoughts, and sound effects are all part of the visual language that is unique to comics” (Al-Jawad and Czerwiec 82). Hence, we may infer from this discussion that comics are a multimodal discourse to be analysed using multimodal discourse analysis techniques. However, comics are fundamentally a visual medium of representation.

Gunther Kress and Theo Van Leeuwen have introduced the multimodal method to study the form of data that uses text, image and colour. Kress argues that multimodality is the normal condition of human communication. We use images to show what will take much time in reading process. Text is used to name what cannot be shown by images and colour is used to highlight which aspects we need to focus. He further remarks that we use one of the many ways of doing discourse analysis which is based on social semiotics (Kress and Van Leeuwen).

Kress and van Leeuwen’s model is the social semiotic theory of multimodality. We

can notice semiotic effects everywhere from media to the communication of messages, especially “at the level of semiotic production in the shift from the older technologies of print to digital, and electronic means” (Kress 6). Their focus is not on the iconographical effects of separate elements of images as lexical items, rather on the cumulative effect in combined form as meaningful wholes. Gunther Kress and Theo van Leeuwen remark that their grammar of visual design is a general-purpose tool having “principles that can apply to an oil painting as well as a magazine layout, to a comic strip as much as to a scientific diagram” (Kress 4).

Kress and Leeuwen derive their model from Michael Halliday’s metafunctions of language. They believe that the theory of systemic functional linguistics may be adapted for visual analysis (Kress and van Leeuwen 16). Ideational, interpersonal and textual functions correspond with the patterns of representation, interaction and composition respectively. The patterns of representation refer to the people, places and things represented in the image. The patterns of interaction refer to the resources which create a link among the viewer of the image, maker of the image and those represented in it. The patterns of composition are related to the ways through which two above-mentioned patterns integrate into a meaningful whole.

Representation is realized through relating the participants in narrative or conceptual forms. Participants may be of two kinds: interactive participants those who interact with the visual as viewers or producers and represented participants those who are depicted in the image (Kress and van Leeuwen 113). There are two kinds of representation: narrative and conceptual. Narrative representation uses action verbs in the form of directed actions that are called vectors. A vector may be conceived as an oblique line made by arms and objects, which makes a connection between participants. Visual grammar uses these vectors to convey the sense of semantic roles.

In actional processes, if the vector starts from the participant, he is the actor. If it leads to the participant, he is the goal. If there is only one participant in the image, it is non-transactional. If there are more than one participant in it, it is transactional. On the other hand, in reactional processes, participants give reaction through gaze to some object. The reactor is a human or anthropomorphic entity. The receiving participant of the gaze is called phenomenon. Reactional processes also have transactional as well as non-transactional sub-processes.

Secondly, conceptual representation refers to the constructs that represent participants in “more generalized and more or less stable and timeless essence, in terms of class, or structure or meaning” (Kress and van Leeuwen 76). Such representation is composed of classificational, analytical and symbolic processes. In classificational processes, subordinates are related to one or more overt or covert superordinates. Analytical processes join the participants in a part-whole bond. Two types of participants are involved in it: the Carriers, which represent the whole and Possessive Attributes, which are the parts. Symbolic processes refer to the meaning or nature of participants.

Interaction is the social relation developed between interactive participants and represented participants. An image builds relationship between the producer of images and the audience. Interaction comprises three basic categories: contact or gaze, social distance and attitude. Gaze has two types: offer gaze and demand gaze. Offer is made when represented participants look at one another or look outside the image or frame. When the participant looks outwards at the viewer, he creates demand. Social distance refers to the size of frame which represents closeness of viewers to the participants. Attitude or point

of view towards the participants is shown through some visual resources which may be objective or subjective. Horizontal and vertical angles also perform their function in this regard.

Composition is related to how images are composed and how they communicate the ideas. Composition refers to the way interactive and representational resources “are integrated into a meaningful whole” (Kress and van Leeuwen 179). Three principles are associated with composition, which are information value, framing and salience. Information value is related to the positioning of elements in specific image zones which have meaningful information. Left to right means given information to new information. Secondly, top means ideal and bottom means real structures. Thirdly, centre mediates overall structure and margin is just ancillary.

On the other hand, salience considers hierarchies of significance among the elements represented on the page, determining immediate attention to some elements instead of others. Salience may be recognized by such factors as relative size, foregrounding, tonal contrast and sharpness of focus. Framing refers to the dividing lines and shapes which connect or separate the elements of the image. It represents which elements belong to one another and which ones do not. The elements belonging to each other make one unit.

It would be significant to observe how text is related to images in infographics. In this regard, Bateman has given four ways of text-image relations in connection with comics (Bateman 107). These may be ‘inherent’ where the text is the part and parcel of the image representation. They are ‘emergent’ if they use thought bubbles and speech balloons. They are ‘adjoined’ if image and text are connected indirectly through spatial proximity and captions. They are ‘independent’ when image and text are totally separate and relations can be “only signalled by in-text references of the form” (Bateman 107).

Captions are not merely aesthetic appendages rather they aptly and concisely describe an infographic. In this regard, Barthes’ idea of ‘anchorage’ is very relevant. He is of the view that images are polysemous and represent a range of signifiers floating freely under the surface (Barthes 39). Due to this, problem of meaning arises. Text performs the denotative description of the image and is called anchorage by Barthes because it binds the meaning. It creates the correct level of perception. Captions exactly do that.

Visual data related to COVID-19 has been collected from WHO website (World Health Organization), the pages providing advice to the public and it has been analysed through Kress and van Leeuwen’s visual grammar and other related ideas of visual analysis in the framework of Graphic Medicine.

Analysis and Discussion

To cope with stress and maintain mental and physical well-being, WHO advised the public to remain engaged in sports and games. The language of sportsmanship is used to encourage people in times of distress. The WHO infographic represents a multimodal discourse comprising text and images (see Figure 1).

Figure 1*

Sportsmanship in the Fight against COVID-19

*From *Be a Champion in the Fight against COVID-19*, by World Health Organization, CC BY-NC-SA 3.0 IGO.



In Figure 1, the infographic represents five human participants; and two objects, that is, a TV and a sofa to sit in. The background of the visual is blurred, however, the objects and the comfortable environment suggest that it is a home, and the family is observing social isolation. The interactive participants are the World Health Organization (WHO), as an international public health organisation and the public at large. Their narrative action has been represented through the vectors of their raised arms, suggesting their sense of enjoyment achieved by watching games on TV. The accompanied text urges the worldwide audience of the infographic to watch games on TV to become a champion against COVID-19. Therefore, the anchorage of the text suggests that the represented participants are using a strategy to fight against COVID-19. The participants are also giving reaction to the phenomenon of games shown through TV.

As far as conceptual representation is concerned, the represented participants are of various skin colours and ages. The two on the left hand of the viewer are white, other two who are sitting are black and the girl standing behind them is brown. Symbolically, these stereotypes refer to specific types of human beings and finally to the whole humanity. It is quite in keeping with the requirements of Graphic Medicine which aims equality and inclusivity. One of the girls, who is standing behind the sofa, uses her gaze to see towards viewers to demand the action represented in figure 1.

The interaction between the represented people and the viewers is a long shot which represents the public nature of relations between the interactive participants and the people in the image. Therefore, the message is for all regardless of colour, age, region or ethnicity. As far as the attitude of the participants is concerned, they are showing their detachment through the oblique angle of their representation on the horizontal scale. It is, perhaps, due to the official nature of the message in which there is no direct involvement of participants. Vertical level of interaction shows equality between the represented persons and the public at large. Figure 1 also represents language-centred way of human thinking in which text precedes all the other modes of communication. Text is on the left and image is on the right suggesting that it is something new or added to existing text. The text size and contrast of colour highlight the main message of becoming a champion against COVID-19 (Figure 1). Colours of participants' shirts also create salience and grab the focus of audience.

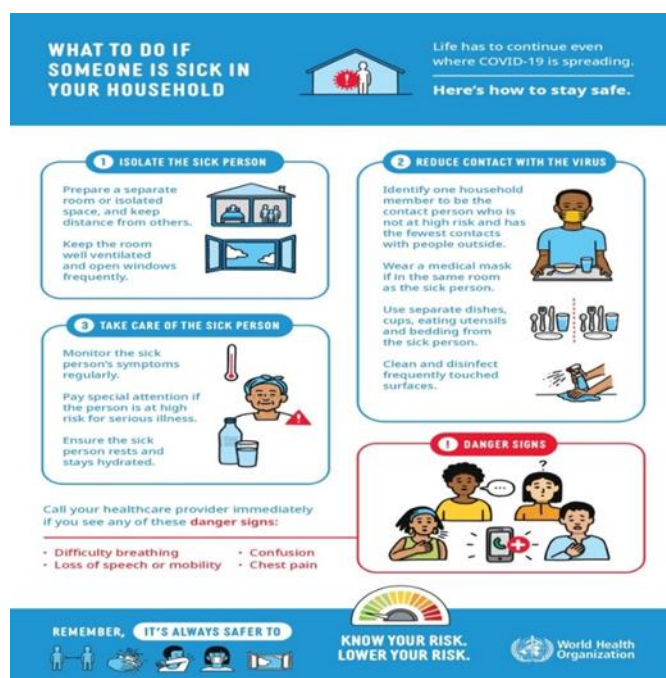


Figure 2*

How to take care of COVID patients in your Household

*From *What to do if someone is Sick in your Household*, by World Health Organization, CC BY-NC-SA 3.0 IGO.

WHO focused on all the aspects and issues related to COVID-19 and relayed guidance about them through their online channels such as website, Facebook page, Twitter handle and purpose-built WhatsApp Channel. It may be observed in the light of Graphic Medicine that infographics shape human perception to communicate their message. The infographic given in Figure 2 is the representative of human participants, medicines, kitchen accessories and home fixtures. Discourse of all the three verbal, visual and diagrammatical kinds has been used in the infographic. Frames are used to segregate various sets of instructions from one another using different colours such as blue and white, and lined quadrangles (Figure 2). Emergency sign has been used thrice in the infographic representing the sensitive and dangerous nature of the issue of one member of family contracting COVID-19.

The human participants used in the first frame (see Figure 2) are of symbolic nature and they symbolize how one imagined patient is socially isolated in a separate room from other members of the family. The accompanying text also gives instructions for isolating the sick one. In Bateman's terms, the text-image relation in this infographic is inherent because both convey the same message. In the second frame, a young man is carrying a tray using his arms as vectors in which he has set food supposedly for the patient. The text on the left side performs the function of anchorage and clarifies that the most resistant member has been appointed as the caretaker of the patient.

The boy in second frame exercises gaze on the viewers demanding from them to follow these steps and roles (Figure 2). The top information is substantive and ideal in the form of general heading and subheading while the bottom information is real and procedural. The steps have been given in the sequential array from left to right. A horizontal line and red frame give information about 'danger signs'. Semiotically, red is colour of danger and emergency. The human participants are once again representative of the whole humanity, reflecting the WHO's role to deal with the global audience. It is noticeable that an empty speech bubble signifies the loss of speech as a symptom of COVID-19. Hence, WHO infographics successfully spread public awareness by using multimodal discourse which can be understood by even those who cannot understand the language properly.

Moreover, WHO issued guidelines about the spread and prevention of COVID-19 via their infographics. They conveyed the message of social distancing, handwashing, and the use of sanitizers and masks to the public through infographics (see Figure 3). So far as composition is concerned, the information has been arranged in the left to right fashion where the left side lists the causes of spread of COVID-19 and right side suggests ways to protect oneself and others. Circular shapes of white colour against the blue background achieve salience and at times do the task of segregation and separation as frames. Diagrammatical resources of arrows have been used as logical vectors to represent the causes of the spread of COVID-19 and towards the arrowhead are the ways of protection. These arrows (see Figure 3) also give logical symmetry to the whole infographic as the information given below is also arranged on the same pattern.

In the Figure 3, the representation includes close shot of girls and distanced features blurring shot of boys and close shots of hands being washed. On the left side, the girls are present in a shared social space, and the narrative action is that the girl on the left is sneezing, and other is the target of the droplets of her sneezing as shown by two drops on her face. Hence, it is only through infographics that the invisible has been made visible. The right-side interaction between these represented girls shows two things: the girls, hence the viewers as well, should maintain a distance of one metre and use facemasks. The separate frames shown by white colour also represent social distancing.

Figure 3*: Safety Measures for COVID-19

*From *How to Protect yourself from COVID-19*, by World Health Organization, CC BY-NC-SA 3.0 IGO.

The second line also gives the guidelines of observing a social distance in social settings. However, the social distance in the second line shows the long-distance frame, hence, the public space. The message concludes that one should maintain social distancing in public spaces. In the same way, handshakes also spread pandemic and two way precautionary measures should be used to protect oneself and others. It also advises the public not to touch their faces with hands and to keep washing their hands with soap (Figure 3). The things which are used by multiple people should be sanitized for protection.

Besides, WHO dealt not only with physical aspects of the disease but also with the social and mental aspects. During COVID-19, people were socially isolated, even quarantined in their homes. There were no special physical or mental activities available for elders and children. News of death and spread of coronavirus were making people depressed. Kids were not allowed to go out into parks or playgrounds. Therefore, the WHO disseminated infographic about parenting advice during COVID-19 as shown in Figure 4.

**Figure 4***

Parenting Advice regarding 'we' Time in COVID-19

*From *COVID-19 Parenting: One-on-one Time*, by World Health Organization, CC BY-NC-SA 3.0 IGO.

In Figure 4, the represented participants are symbolic persons resembling the character of Humpty Dumpty. There is an advantage of the use of such participants. Firstly, they provide the greater space for imagination, and anyone can identify with these images. Secondly, popular characters of this kind grab the attention of maximum viewers. They make the gravitational pull of the comic/infographic. The accompanied text clearly says that time should be allocated for each child. It not only makes the verbal resource of the infographic but also adds to the meaning of the visual resources. Narrative action as represented by the left side activity is reading. Books may be a good pastime during pandemics such as COVID-19. Right sided participants are involved in playing with blocks (see Figure 4). In their conceptual representation, parents and children have been differentiated on the basis of the size and shape of the participants. They are also gazing at the viewer and smiling, thereby demanding action on the part of parents who are the interactive participants of the infographic.

Moreover, in Figure 4, the angle of representation is frontal which means that represented participants want the immersion and involvement of viewers into the situation. Thus, inclusivity is the main motive of Graphic Medicine. It is the visual way of stressing the multimodal message. Information value has been set in the ideal-real mode in which the top caption and the text convey the message in an abstract manner, and the bottom gives concrete information in the form of images. Multimodality is the process of semiotic multiplication in which verbal and visual modes exponentially increase the semantic load of the message and the message becomes more effective.

Salience achieves alternative ways of reading over and above the method of traditional reading. Salience is an effective tool in the online communication of public health messages. In the verbal part, the phrase ‘with each child’ has been put in a different colour and a bigger font (see Figure 4). It is the foregrounded item gets the viewers’ attention to the children. Secondly, colour contrast of the represented participants is also attention-grabbing.

Masks were a spectacular reality of the COVID-19 period. Everybody was required to wear masks wherever they were. WHO issued clear instructions in the form of do’s and don’ts in side-by-side infographics on their website. Therefore, I have also set these infographics one after the other for maximum effect as shown in Figure 5 and Figure 6. Such juxtaposition of visual elements has its own impact and effectiveness.



Figure 5*

Do's of Wearing Medical Masks

*From *Medical Masks-Do's*, by World Health Organization, CC BY-NC-SA 3.0 IGO.

Figure 6*: *Don'ts of Wearing Medical Masks*

*From *Medical Masks-Don'ts*, by World Health Organization, CC BY-NC-SA 3.0 IGO.

The represented participants in these infographics are the actors 'frozen' in performing some action or the objects such as masks (Figure 5 and Figure 6). It may again be noted that in both infographics skin colours of participants are symbolic of the whole humanity. Discursively, the message is intended for everybody, ranging from the American film star to the Pakistani farmer, from the Chinese manufacturer to the Somali student. Furthermore, the instructions are also for those engaged in public healthcare profession along with general public. The infographic dealing with do's (see Figure 5) fulfils the criteria of the definition of comics as a sequential art. The compositional arrangement of visual resources along with their captions is in the form of logical steps to be followed from left to right arrangement. It is the order of the English language in which we read an English sentence.

The setting of white frames of don'ts in Figure 6 is also in the form of rows that may be read from left to right but there is no sense of sequence on the logical level. They may be read in any other fashion as well. The instructions written in the imperative mood make anchorage in the Barthesian terms for the image which fixes the meaning at a specific level. Otherwise, a mask hanging in the air may have infinite meanings. Have a look on the second frame of Figure 5, it is the instruction "[i]nspect the mask for tears and holes" (Figure 5) which makes the things clear. Participants in each frame are involved in one action or the other using the vectors of their hands or arms. Although a salient "Don'ts"

has been written in Figure 6, the diagrammatical representation of don'ts using X's (cross signs) superimposed on each frame makes the message more effective and clearer.

The apocalypse was there but life had to continue in the times of COVID-19. WHO developed the infographic about precautions for grocery shopping. The represented participants are buyers, busy in the act of buying groceries and the represented objects are related to the field of public healthcare as it is applicable to the conditions of COVID-19. The composition of the infographic comprises frames associated with particular steps and occasions such as “reduce your risk” and “when inside stores” (Figure 7). Further, the gutter between two frames has been used creatively to insert text associated with the upper or the lower frame.

Figure 7*: *Grocery shopping in COVID-19*



*From *Shopping for Groceries: COVID-19*, by World Health Organization, CC BY-NC-SA 3.0 IGO.

The narrative function of shopping has been represented by human actors whose arms and hands are vectors, representing those holding products of daily use. One frame has only objects in it, such as a list of local instructions, masks and sanitizers. These are the things to be taken care of ‘before one goes out’ (Figure 7). Conceptual representation shows participants as a group of carriers who possess products of daily use in their hands. One of their possessive attributes is the presence of masks on their faces which asks the viewers to use masks when going to the market. A covert superordinate of the instruction of using face masks joins together the subordinate frames in one whole.

The nature of interaction between the viewers and the represented participants is that of an offer, because the represented participants do not look directly at the imagined viewers (Figure 7). By their example, they are offering the visual model for others to follow

in a simple manner. The social distance represents a long shot which means that the buyers are in a public space that is a market. The horizontal angle of representation is oblique which means that there is an air of detachment about the buyers vis-à-vis viewers of the infographic. Such detachment is quite a characteristic of shopping for groceries. It may also be observed that centre-margin arrangement of multimodal information has been effectively used. Main message has been allotted the central space, and subsidiary information has been given in the marginal space, for example, in figure 7 things to remember have been represented in the footer of the infographic.

The results of this study partially contradict those of a recent study (Zia) which studied COVID-19 infographics in the Pakistani context using information design rubric developed by Kibar and Akkoyunlu. The rubric had criteria of title, elements, font, colour and layout with evaluative scores from 0 to 4. Zia found that the weak visualisation and elements received the lowest scores, affecting the understandability and unity of infographics (Zia 289), whereas my study highlights the performative nature of elements and proficiency of visualisations. Both studies concur on the effectiveness of captions and colours. Secondly, the results are in line with another study conducted by Mohamadpour et al. using Kress and van Leeuwen's discourse analysis model in the context of Iran which finds that the staring look in the COVID-19 related billboards and infographics creates a very strong connection with audience but very few infographics are designed on this principle. Similarly, head-on shot images represent a high degree of inclusion but only a small percentage of infographics has this technique used in them (Mohamadpour et al.). This study agrees with their conclusion that visual factors in COVID-19 infographics are very effective in drawing the audience to encourage them to apply health messages. One cause of the better effectiveness of WHO infographics may be due to the global scope of the organization and long experience of dealing with health communication in various perspectives. WHO infographics have achieved a high degree of effectiveness and efficiency in terms of equality, empathy and inclusion.

Conclusion

It may be concluded that WHO performed its duty to inform the public about precautions to be taken during COVID-19 pandemic in an effective and efficient manner. As a part of their public advice role, they used WHO infographics to disseminate public advice through multimodal discourse of infographics. Using culturally diverse figures, such as diverse skin colour or symbolic figures, WHO infographics address the whole human race. Such equality and inclusivity are the hallmarks of Graphic Medicine. The human participants represented in the infographics demand action from the viewers in a proactive manner. The artistic design of infographics affects the perceptions of viewers to move them into action.

Similarly, it has been noted that the visual resources of the infographics directly involve viewers into the represented situation. Frames and sequential array have been judiciously used in infographics to segregate the steps or parts of the whole. The public healthcare messages regarding the use of masks and sanitizers, social distancing, social isolation, and time management have been effectively conveyed through WHO infographics. Furthermore, captions have efficiently kept the polysemous nature of visual elements at a specific intended level of interpretation. Even those who cannot understand English are able to understand the visual part of the infographic. Overall, WHO infographics have successfully conveyed the public healthcare information in a time of global crisis, in keeping with the tenets of Graphic Medicine.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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