

Feasibility of comics in health communication: Public responses to graphic medicine on Instagram during the Covid-19 pandemic

Xin Zhao, Anna Feigenbaum, Shannon McDavitt

Abstract

The Covid-19 pandemic has called for effective health communication strategies to better protect the public's well-being, particularly over social media. Among various strategies, health-related comics referred to as 'graphic medicine' were circulated on social media to communicate public health information and to share individuals' struggles with mental health. Despite a growing body of research in the field of graphic medicine, studies on public responses to graphic medicine are rare, leaving a gap in understanding the feasibility of these comics for effective health communication over social media. To address this gap, this study focused on Instagram audiences' responses to graphic medicine posts related to the Covid-19 pandemic that were circulated on the platform. It used qualitative content analysis to study 334 comments on 11 comics related to mental health and 159 comments on 10 comics related to vaccination. Findings evidence the feasibility of graphic medicine as a tool for health communication relating to showing empathy, contributing personal experiences and knowledge, and understanding and elaborating on health-related knowledge, what we refer to as 'health literacy.' Empirical implications of health communication through graphic medicine are discussed alongside the similarities and differences found in the comments relating to these two distinct Covid-19 issues.

Keywords: graphic medicine, health communication, social media, mental health, vaccination, qualitative content analysis, Covid-19 pandemic

Starting from late 2019, the Covid-19 pandemic has urgently called for academics and practitioners to identify effective, social media-based health communication strategies to help the public better protect their physical and mental well-being (e.g. Ihm and Lee 2021, Duong et al. 2021). Schiavo (2013: 9) provides an integrative definition of health communication that reflects our approach to this project.

[Health Communication] is concerned with reaching different populations and groups to exchange health-related information, ideas, and methods in order to influence, engage, empower, and support individuals, communities, health care professionals, patients, policymakers, organizations, special groups and the public, so that they will champion, introduce, adopt, or sustain a health or social behavior, practice, or policy that will ultimately improve individual, community, and public health outcomes.

Accordingly, the most common attributes of health communication include keeping individuals informed about health-related issues, increasing their comprehension of these issues, encouraging the exchange of relevant information, and achieving desired social and behavioural results (Schiavo 2013).

Among the wide range of health communication efforts made during the pandemic, a group of artists produced graphic medicine comics, often distributing them on social media platforms (Saji, Venkatesan, and Callender 2021). The term 'graphic medicine' was coined in 2007 by Dr. Ian Williams - a physician, scholar, and comics artist - to bridge healthcare and comics (Green and Myers 2010). Graphic medicine refers to "the intersection of the medium of comics and the discourse of healthcare" (Czerwiec et al. 2015: 1). The term now covers both a graphic genre and a critically acclaimed non-profit organisation where artists use the comics medium to communicate their experiences of healthcare from both patient and medical professional perspectives. Sharing this material and research in the field is also coordinated through annual conferences and online channels (Alberda 2020, Czerwiec et al. 2015). Today, graphic medicine covers a broad range of genres and forms, including memoirs, pathographies (narratives of one's illness), zines, anthologies, comic books, informational comics strips, webcomics, instacomics, and interactive folded comics (Alamalhodaie, Alberda, and Feigenbaum 2020, Alberda 2020). Comics falling under the category of graphic medicine deal with a range of health-related issues, such as illness, disability, healthcare, patient education, treatment and patient experiences, and practitioner experiences (Alamalhodaie, Alberda, and Feigenbaum 2020, Green and Myers 2010). Perhaps most notably, graphic medicine works to emphasise the human side of health experiences that

play out alongside the clinical language of the healthcare systems (Czerwiec et al. 2015, Czerwiec and Callender 2020, Farthing and Priego 2016).

Recent scholarship has emerged addressing the potential of graphic medicine in health communication. While previous studies explored perceptions and uses of comics in mental health and social care educational settings (e.g. Farthing and Priego 2020, Green 2015, Myers et al. 2020), seldom studies have zoomed in on everyday readers' responses to graphic medicine (King 2017). Attempts so far to study audience responses have not yielded consistent findings (e.g. Koops van't Jagt et al. 2018, Leung et al. 2017), leaving a gap in our understanding of the impact that graphic medicine can have on "knowledge transfer, empathy gain, and behavioral change" among the audience (Noe and Levin 2020). Witnessing the vast amount of graphic medicine produced and distributed on social media during the pandemic and the urgent demands for effective health communication strategies, Kearns and Kearns (2020) called for more studies on the potential of comics as a public health communication tool, especially on social media. This call echoed the need for more empirical studies on the relationship between social media-based health communication and people's well-being (e.g. Burke and Kraut 2016, Escobar-Viera et al. 2018). Our study aims to help fill this gap by using social media comments as a site to analyse the benefits and potential drawbacks of graphic medicine as a means of health communication.

Using comics in health communication

Comics are an art format that has established aesthetic elements (i.e. panels, context, text, symbols, and characters), but is flexible in ways of expression (e.g. the combination of different elements in different sequences) (Bach et al. 2017, 2018). Advocates of graphic medicine believe that this genre mobilises the graphic medium of comics to communicate health-related information (e.g. Czerwiec et al. 2015, Green and Myers 2010, McCloud 1993, McNicol 2017, Williams 2014). Alexandra Alberda (2020) describes the work comics do as approachable, accessible, and relatable. Together these features make comics suitable to help communicate the complex data and sensitive topics often involved in health communication.

First, the comics medium enables *approachable* communications. Comics are a familiar medium to people (McCloud 1993). They are prevalent in popular culture, created and consumed across many cultures (Buyayisqui, Bordoni, and Garbossa 2013, Yu 2015). In addition, readers have control over their engagement with comics. As opposed to videos, comics deliver messages through words and images, enabling readers to process messages at their own speed (Bach et al. 2018, Kearns and Kearns 2020).

Secondly, comics are *accessible*, or *comprehensible*. Comics are usually presented in an easy-to-understand format (e.g. panels, juxtaposed pictorial and other images, messages arranged in a deliberate sequence). This helps to guide readers through complex messages (McNicol 2017), especially data-based information (Bach et al. 2017, McCloud 1993). As supported by the dual coding theory in cognition studies, this word and image format makes comics suitable to be used in educational contexts (Aleixo and Sumner 2017). For example, Koops van't Jagt et al. (2018), empirically identified that participants from both low literacy and high literacy groups who read the information on diabetes presented in the format of a fotonovela (a comic form using photos and text) significantly outperformed those who read a traditional brochure in acquiring health-related knowledge. In line with these findings, Muzumdar and Pantaleo (2017) found that vaccine information flyers using a comics format had a significant relationship with participants' perception of the informativeness of the flyers. As these studies empirically evidence, comics often connect with readers by using iconography that is familiar to particular cultural audiences (Bach et al. 2018, Czerwiec et al. 2015, Williams 2014). Iconography can target local, regional, or national identities with recognisable images, which can get closer to culturally specific meanings than using text alone.

Building on the above two features, scholars also argue that comics are *relatable* to readers. Artists of comics, especially autobiographical comics, use this medium to share a story (Farthing and Priego 2016) and express the everyday flawed self (El Refaie 2012, 2019). Comics can effectively communicate the character's inner world (e.g. mood states), such as mental illness (Williams 2015) and distress (Lo-Fo-Wong et al. 2014), through the simultaneous presence of subtext, performative encounters, and conflicted feelings (Czerwiec and Callender 2020, Green and Myers 2010,

Squier 2009). As summarised by Koch (2016: 29), “the visual-verbal medium of comics is particularly apt in showing how intricately mental states are bound up with lived bodily experience and an embodied sense of self.” These disclosures mean that comics use personal experiences as a basis for the readers’ interpretation process (McNicol 2017).

Together these approachable, accessible, and relatable features of comics invite readers to participate in the interpretation of others’ experiences and to empathise with the characters in the comics (Rothwell et al. 2021, Williams 2015). Being empathetic means identifying with and understanding another person’s situation and feelings (Preece and Ghozati 2001). It involves 1) knowing what another person is feeling, 2) feeling what another person is feeling, and 3) responding compassionately to another person’s distress (Levenson and Ruef 1992: 234). As a consequence, comics can make people feel “less isolated and more hopeful” (Green and Myers 2010: 577).

These features of comics make them especially suitable for health communication because they “can offer patients and family members opportunities for self-awareness, reassurance, empathy, companionship and ways to explore the impact of illness on family relationships” (McNicol 2017: 20). Empirically, comics have been shown to help express and embrace lived experiences, for example, by the LGBT community in sharing collective trauma and building solidarity (Fredricks 2019); by youth dealing with mental health issues (Rice et al. 2021); and by those who suffered eating disorders (Venkatesan and Peter 2019).

While comics have been proven successful in improving empathy, engagement, and comprehension across this range of studies, some scholars have also flagged up questions regarding the appropriateness and effectiveness of comics for health communication. First, readers may consider comics as being juvenile and funny and thus not suitable to communicate serious, health-related issues (Ashwal and Thomas 2018, McNicol 2017). Second, the personal healthcare experiences of the comics creators may not directly resonate with those of their readers (Ashwal and Thomas 2018). Third, showing illness in comics may invoke uncomfortable feelings among readers (e.g. disgust) and reinforce the link between sickness and ugliness and

impotence (McNicol 2017, Williams 2015), or might induce anxiety (Rothwell et al. 2021). Fourth, comics might be effective in communicating complicated messages to young patients, but more studies are needed to identify the impact of graphic medicine on health communication with adults (Garrison-Joyner and Caravella 2020). Fifth, the representation and coverage of different illnesses have not received equal attention in comics (McNicol 2017). For example, diseases like diabetes and depression received much more attention in comics than others, biasing existing research toward a sub-sample of illnesses and conditions. Sixth, the effectiveness of comics in increasing health-related knowledge among the broader public remains inconclusive. For example, Koops van't Jagt et al. (2018) and Muzumdar and Pantaleo (2017) identified positive outcomes, while Leung et al. (2017) and Leung et al. (2014) did not identify the same effect. Inconsistency was also observed in the effectiveness of comics for increasing the public's health-related behaviours. For instance, Koops van't Jagt et al. (2018) and Muzumdar and Pantaleo (2017) did not find positive outcomes, while Leung et al. (2014) did. Overall, based on existing research, there are clear indications that graphic medicine can be a useful medium for health communication, yet its feasibility as a tool for broader public health communication remains tentative.

Graphic medicine during the Covid-19 pandemic

During the Covid-19 pandemic, people's lives became entwined with various graphic public health information, such as instructional hand-washing infographics and calls to flatten the curve. Alongside authorial graphics produced by the world's most influential mainstream news outlets and health organisations (e.g. BBC, World Health Organisation) artists produced and disseminated their works about Covid-19 on social media platforms (Green and Wall 2020). These comics cover the "philosophical, material, and emotional responses to the Covid-19 pandemic," with content ranging from educating readers about the virus to revealing the pandemic's toll on individuals' physical and mental health (Saji, Venkatesan, and Callender 2021: 142).

These graphic medicine comics communicated complex health-related issues and information throughout the pandemic, with topics such as self-isolation, social

distancing, vaccination, and national lockdown, as well as mental health issues, including depression and anxiety. These comics circulated at a time when the public needed to rapidly make informed decisions, protect their well-being, and safeguard others (Kearns and Kearns 2020). All this rapid change occurred in a climate of uncertainty, during which people were asked to be hypervigilant about their behaviours. This contributed to feelings of irritability, overwhelm, exhaustion, burnout, and anxiety (Cullen, Gulati, and Kelly 2020, Hepburn 2020, Pfefferbaum and North 2020). As people tried to hide or contain these feelings at home and work, health professionals and researchers noted a further deterioration of mental well-being (see the review by Hamouche 2020, Hepburn 2020). Moreover, such times of rapid and uncertain change tend to magnify people's attention to their bodily functions and sensations (e.g. pain) leading to increased health anxieties (Williams 2014). Therefore, gaining emotional intelligence over one's feelings and the feelings of others becomes central to wellness practices both in workplaces and in daily life. All these complex physical and mental health dynamics were captured and narrated in the sample of graphic medicine comics collected for our research study.

However, although we know that graphic medicine comics were used to communicate about the pandemic on social media, we do not know what effects these posts had on increasing health literacy for public audiences. It is, therefore, necessary to empirically examine graphic medicine's feasibility for public health communication on social media. Specifically, more research is needed into how graphic medicine can inform the public about public health guidance and communicate advice for managing mental health well-being in uncertain times. As a contribution to the gap in existing literature, this study asks:

How were graphic medicine posts received by social media audiences? What can we learn about the feasibility of graphic medicine as a tool for communicating public health guidance and well-being advice from people's responses to this material?

Methodology

This study used a subset of data produced for the UKRI/AHRC Covid-19 Rapid Response project 'Comics in the time of Covid-19: Tracking data on web-based comics and evaluating their potential for communicating public health messages' (AH/V012614/1). The larger project web-scraped over 15,000 comics on Covid-19 published between January 2020 and March 2021. We used hashtags to gather posts giving priority to Covid-19 hashtags such as #covidcomics, #covid19comics or #coronavirus comics. Next, we considered pandemic hashtags, such as #lockdowncomics, #pandemiccomics and #viruscartoons. The third group consisted of the data collected from selected artists' Instagram profiles, chosen due to their engagement with graphic medicine. Finally, the last group of hashtags comprised of intentional community hashtags, which were not explicitly focusing on the pandemic yet were still oriented to the communication of public health messages via comics. The criteria used for data scraping were then organised in groups using a hierarchic model, based on their popularity and relevance to this project (see appendix 1).

Team members worked to refine the original dataset of Instagram posts to those that were 'in scope.' This was defined as posts that were comics in English that contained explicit public health messages. The refinement process left us with 3,130 public health comics. Comics came from all populated continents. Of the comics with a clearly identifiable country of origin (just under 60% of the sample), nearly half came from the United States, with the United Kingdom at 15%, and India representing the third-largest contribution with 8%. Comics were sourced from just over 1,000 unique users on Instagram; however, the distribution clearly resembled a long tail, with 20 artists contributing 25% of the total number of comics analysed. We filtered out reposts, leaving a sample of 2,340 original comics.

To investigate the feasibility of graphic medicine for communicating (1) public health guidance and (2) mental health and wellness advice, for this study, we sub-sampled the above dataset by extracting comics coded as having the primary Covid-related issues of 'vaccination' and 'mental health.' This resulted in an initial sub-sample of 79 comics on vaccination and 441 comics on mental health. The graphic medicine posts related to mental health were often produced by an individual comics artist sharing their own healthcare experience related to the pandemic, including a slice of life, pathography, and testimonial genres. Graphic medicine posts related to vaccination

generally fell in the genre of infocomics, referring to educational and instructional comics primarily designed to explain health-related medical information.

We then queried this sub-sampled dataset to return only those comics with 25 or more comments. While comment numbers were scraped in the original dataset, comments themselves needed to be extracted, read, and coded by going back to the original source links on Instagram. For our qualitative content analysis, we extracted the first 20 comments (posted in English), or all comments if the number of suitable comments was less than 20. Comments that consisted only of emojis and short phrases were included, but we excluded replies from the posts' authors. The total number of sampled comments related to mental health posts was 334, and to vaccination was 159 (see appendix 2 and 3). We randomly labelled the graphic medicine comics analysed from 1 to 21 for the sake of convenience and clarity in our presentation of findings.

We used qualitative content analysis, which refers to the “rearticulation (interpretation) of given texts into new (analytical, deconstructive, emancipatory, or critical) narratives that are accepted within particularly scholarly communities” (Krippendorff 2018: 17). Specifically, we employed the approach of directed qualitative content analysis (Hsieh and Shannon 2005). The codebook for this comments analysis (see Table 1 below) was informed by prior categorisations of audience responses to graphic medicine and was augmented by patterns emergent in the data. The category of “knowledge comprehension and elaboration” is operationalised based on Yang and Shen (2019) and Zheng et al. (2015). The category of “empathy” is operationalised based on the key qualities of empathy (Levenson and Ruef 1992) and the Toronto Empathy Questionnaire (Spreng et al. 2009). It is notable that we included extending gratitude to the artists (e.g. being thankful and appreciative) in the category of “empathy” based on Lazarus and Lazarus' (1994) explanation that the capacity to empathise with others underlies gratitude, as an empathic emotion. Going through the data also yielded the category of “knowledge contribution” which is closely related to empathy in health communication (Zhao et al. 2013). We applied all relevant categories to each comment. To interpret Instagram users' responses, this study combined the “rank order comparisons of frequency of codes” and the context of the Covid-19 pandemic

(Hsieh and Shannon 2005: 1283). Overall, the method of qualitative content analysis combined the strengths of quantitative methods (i.e. quantifying audience responses) with those of qualitative methods (i.e. considering the speciality of data when generating the codebook and contextualising the data in data interpretation) (Kracauer 1952).

Table 1. Operational definitions of categories of the comments and examples.

Category	Operational definition	Example
Knowledge comprehension and elaboration	Understanding the messages communicated and generating relevant thoughts on and asking questions about the messages communicated.	“Are the phase one ones already being tested or it indicates what will happen?”
Empathy	Knowing what the artist is feeling, feeling what the artist is feeling, and responding compassionately to the artist’s distress.	“Another awesome and relate-able edition of your artistic storytelling (feels like your work is more than a comic to me) LOVED the reference to Dr. Bessel Van der kolks Body keeps the score!! Bessel is one of my spirit animals!! That book was life changing!”
Knowledge contribution	Contributing personal experience (e.g. emotions and feelings, or narrative accounts of experiences) and personal knowledge.	“Yesss... I keep telling myself the goal isn’t necessarily to keep myself from getting the virus, it is to keep from spreading it to someone else!”

Other	Comments not falling in the above categories	“Why does instagram suppress all covid content? Because of the wappies? 😊”
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Findings and discussion

This study found that graphic medicine is feasible in communicating health-related messages in both areas of mental health and vaccination, attracting comments in similar, and yet also different, patterns between the two topics. We explain our findings in more detail below.

As shown in Figure 1, out of 334 comments on graphic medicine posts related to mental health, only one comment fell in the category of “*other*,” and five out of 159 on posts related to vaccination were coded as “*other*” (see Figure 2). Interestingly, none of these six “*other*” comments critiqued the format of the comics as being juvenile (Ashwal and Thomas 2018, McNicol 2017), being out of touch (Ashwal and Thomas 2018), or inducing uncomfortable feelings and emotions (McNicol 2017, Rothwell et al. 2021, Williams 2015), etc. The remaining comments on both mental health and vaccination posts conveyed empathy to the artist, contributed their personal experiences, shared knowledge regarding the topic communicated in the posts, indicated their understanding of the information, and/or elaborated on the knowledge communicated in the posts. This finding suggests that graphic medicine is feasible in health communication during the pandemic when gauged by the definition and key attributes of health communication (Schiavo 2013).

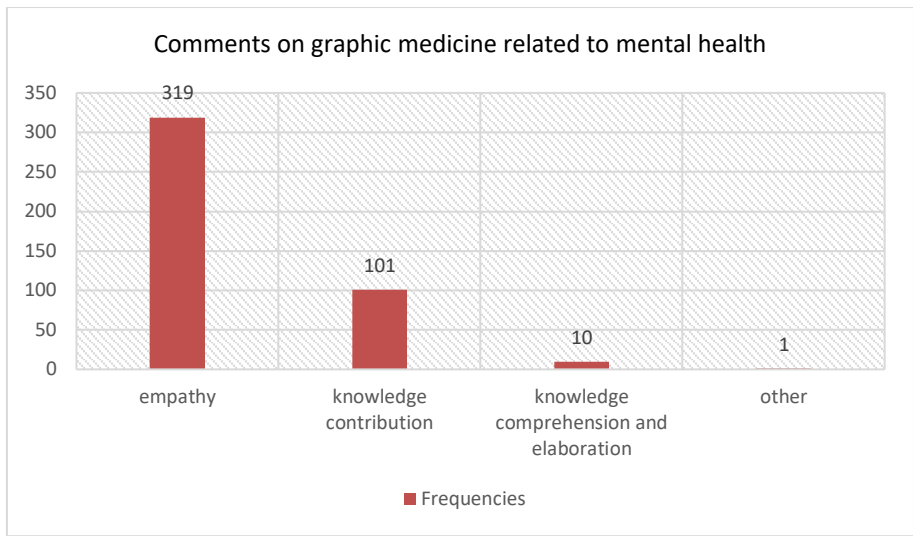


Figure 1. Frequencies of applications of categories in comments (mental health).

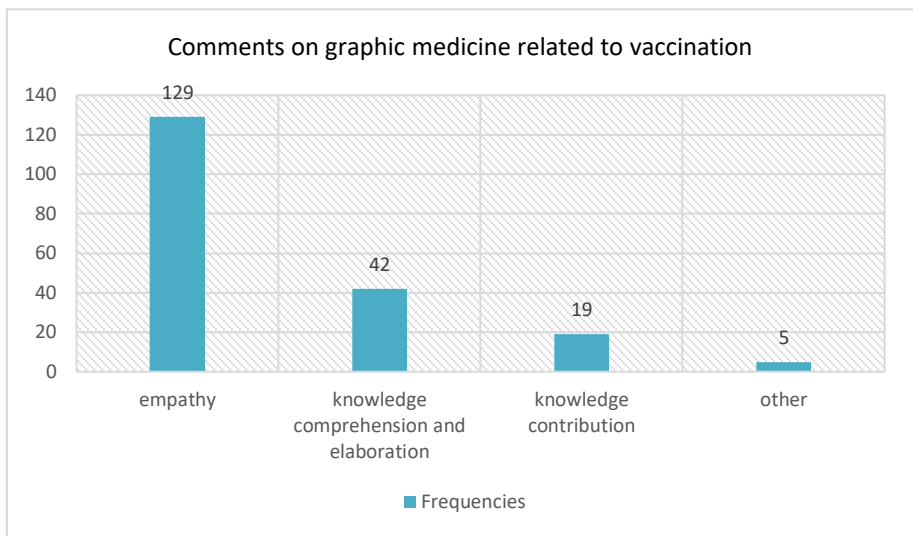


Figure 2. Frequencies of applications of categories in comments (vaccination).

More nuances of Instagram users’ responses to the selected graphic medicine posts appeared when zooming in on the patterns found across the comments. First, the category of “*empathy*” dominated the comments on graphic medicine posts in both topic areas. This finding echoes arguments by scholars about the approachable, accessible, and relatable roles that comics play. By interpreting and empathising with the character, comics connect the reader both with the character and with the relevant health issues (Rothwell et al. 2021, Williams 2015). This finding was, unsurprisingly, dominant in the comments on graphic medicine related to mental

health. For example, a series of comments under Comic 2 expressed Instagram users' gratitude to the artist for being able to communicate such relatable experiences:

"I had such a similar experience yesterday. Your work is so relatable and inspiring. Thank you 🥰❤️🙌🏻💯"

"You're so talented, and with such a lovely way of communicating the therapy process ❤️ I'm sure you speak to so many people xx"

"Yet another brave and useful illustration of how to connect the emotional dots to the present. Thank you for sharing your journey."

Similarly, audiences also showed empathy to Comic 10, which depicted the artist's anxiety and distress towards Covid-19 because of a "chronic issue that resurfaced" (texts inserted in the comics by the artist):

"Oh honey how awful. I have a friend who has the same issue."

"[S]orry to hear about the pain that keeps creeping back. I know what you mean about all the thoughts that pop in and out. Sometimes [I] find writing out the things [I] want to change/do when [I] can helps me but sometimes it's good to ride the wave of feelings. There's no right way forward but to take it one step at a time the way you want to go. Sending positive thoughts!"

Interestingly, comments posted under vaccination-related graphic medicine comics, which are primarily informational and instructional, also mainly focused on showing "empathy." For instance, Comic 14 illustrated the current stage of development of the Covid-19 vaccination programme at the time, citing an article from the "Nature Journal." Audiences expressed how they appreciated and resonated with the artist:

"I love how you make things beautiful that don't need to be. You are an asset!"

"Yes! I been doing the same!! Keeps me hopeful."

"Thanks Mona, this is indeed heartening 🙌🏻."

Similarly, in response to Comic 20, which showed the mechanisms of the immune system and antibodies, readers left comments such as:

“Gratuitous comment to boost exposure of this content”

“👏 awesome presentation!!!”

“Thank you. Thank you. Thank you. Did I say thank you? Thank you.”

A possible explanation of the high frequency of “*empathy*” in comments across both mental health and vaccination comics might be that the pandemic-wounded public needs solidarity, not only concerning emotional responses to the pandemic and its collateral consequences but also about the newness of Covid-19 vaccination. Being empathic, i.e. knowing, feeling, and responding compassionately to others’ lived experiences (Levenson and Ruef 1992), can help with the building of solidarity (see the review by De Vecchi et al. 2016). As suggested in this analysis of comments, the participatory reading of graphic medicine posts on social media makes people feel “less isolated and more hopeful” (Green and Myers 2010: 577), which is an indication of the building of solidarity. This finding has important empirical implications. Establishing solidarity is already regarded as one of the key factors for effective health communication during the pandemic (Finset et al. 2020). Expanding on this, our study suggests that health communication practitioners may benefit from a wider and more systematic use of graphic medicine both in the pandemic recovery and in future public health communication, particularly during times of rapid change and uncertainty.

Secondly, in addition to being empathic and grateful to the artists, nearly a third of comments (101 out of 334) on graphic medicine related to mental health also showed “*knowledge contribution*,” resonating with people’s lived experiences in ways that deepened their understanding of themselves and others. This category ranked second after “*empathy*” (see Figure 1). Examples include:

“Ohhh I hear so much of this. I go through this same cycle of emotion. We WILL get through this. And in the meantime, let’s follow great artists and fall in love with their work! 🌈❤️”

“Every time I cough I ask myself “was my throat just dry? Do I just need water? Or is this the virus?” 😨”

“Thank you for your beautiful vulnerability. I feel this all so deeply; thank you for putting words and color to it. I wonder if you’ve read *The Prophet* by Khalil Gibran? The passage on Joy and Sorrow... this reminded me of that. It’s a poignant and vital reminder that those two experiences go hand in hand. I’ll send it to you. 💜”

“This WAS a hard week! My usual coping mechanisms/distractions didn’t work either. I’m glad you put this out there, it’s not often that diary comics feel universally relatable but this one just might.”

Some comments (n = 19) on vaccination-related graphic medicine posts also fell into the category of “*knowledge contribution*”:

“I feels ya. This week I’ve unravelled a wee bit. Random digging in my garden and watching the birds helped though.”

“... Your (and other) comics and the Try guys channel was basically what got me through the lockdown and inspired and motivated me to keep studying for my entrance exam for med school. You by showing funny but still educational parts of the life as a doctor and the Try Guys Channel by distracting me and also inspiring me to not give up! Thanks to both of you!” (ellipsis added by the authors)

As shown in the above findings, the empathy fostered by graphic medicine posts is also useful for encouraging audiences to provide support to distressed peers. This sharing of personal experiences and knowledge has been identified as being positively related to empathy (e.g. Trobst, Collins, and Embree 1994, Zhao et al. 2013). In other words, graphic medicine not only fosters positive emotional outcomes for engaged users but also positive behavioural ones, which further cements graphic medicine’s feasibility in health communication (Schiavo 2013).

In addition to “*empathy*” and “*knowledge contribution*,” vaccination-related graphic medicine also attracted several comments on “*knowledge comprehension and elaboration*” (n = 42), ranking the second most frequently applied category for this topic. Examples include:

“I just love how well you translate all that “science stuff” for all of us to understand. Thanks!”

“...your art and explanation of how the vaccine worked made it easier to understand. I actually felt safe to accept it when I was offered it. Before I was sure I wouldn’t because it was new and I didn’t understand it. Thanks to your art I have since had the first dose and felt fine after in case anyone is wondering what after effects happen.” (ellipsis added by the authors)

“These strips are so good and so informative and timely. Great work.”

Graphic medicine posts related to mental health also received a few comments (n = 10) that showed “*knowledge comprehension and elaboration*,” for instance:

“I would say transform the trauma. Yes absolutely. I learned IFS (the Internal Family Systems model) from my therapist. In the book *The Body Keeps the Score*, Bessel Van der Kolk recommends IFS and other modalities like EMDR for healing trauma. It’s taken a few years of work but yes, it’s a made a huge difference.”

This finding resonates with previous studies on the suitability of comics in educational and instructional settings (e.g. Aleixo and Sumner 2017, Koops van’t Jagt et al. 2018, Muzumdar and Pantaleo 2017).

It is important to note that the above findings on the audiences’ responses may not be exclusively a result of the graphic medicine posts but rather a combination of graphic medicine’s approachable, accessible, and relatable features (Alberda 2020) and Instagram’s platform dynamics. The two-way, dialogue-based features of social media, including commenting on posts, have been identified to be positively associated with improvements in psychological wellbeing (e.g. Burke and Kraut 2016, Escobar-Viera et al. 2018, Cherak et al. 2020). Specifically, recent findings have suggested that Instagram could enhance discussions on radiology and related visually-oriented healthcare with its image-based focus (Prabhu and Munawar 2022); be leveraged to aid in eating disorder recovery, combat shame, and improve help-seeking (Goh et al. 2022). This growing body of evidence around the potential

benefits of health communication on social media demonstrates the need for more communication research into best practices—including graphic medicine.

Of the comments falling in the category of “*other*,” we noticed that two comments on vaccination-related posts showed scepticism toward vaccination:

“Vaccines injure and kill. No thank you”

“You won’t find any light anywhere near vaccinations. They’re straight filthy darkness all the way through. The entire premise is rotten to the core, let alone the actual substances, which are deliberately designed to be nothing but diabolical poison 🦴”

Scepticism to science- and health-related knowledge is a complex phenomenon. Scepticism of the Covid-19 vaccination is related to a range of factors, such as spirituality, low science literacy (Rutjens, Zarzeczna, and van der Lee 2021), and conspiracy ideation (Lewandowsky, Gignac, and Oberauer 2013). Moreover, social media has been critiqued throughout the pandemic for its function as a platform that helps spread mis/disinformation, particularly about the Covid-19 vaccination, which contributes to this scepticism (e.g. Basch et al. 2021, Wardle and Singerman 2021). Yet, the ratio of positive information sharing to sceptical comments on these graphic medicine posts (190:2) suggests that more nuanced attention needs to be paid to how evidence-based and empathetic health communication might be able to counter or challenge mis/disinformation on social media platforms. In our sample, the comments sections of these graphic medicine posts overwhelmingly helped generate health literacy and provided opportunities for readers to share opinions and ask questions. This active dialogue between users can help increase comprehension through personal engagement and make health and scientific information more relatable, which contributes to information acquisition and retention (Martin and MacDonald 2020).

Conclusion

This study used qualitative content analysis to investigate audiences’ responses to graphic medicine Instagram posts related to the Covid-19 pandemic, focusing on two

key areas: mental health and vaccination. Overall, our study evidenced the feasibility of graphic medicine for health communication. Almost all comments on these graphic medicine posts in both areas communicated empathy to the artists, contributed personal experiences and knowledge, and showed understanding of health-related knowledge and/or further elaborations.

Three more specific findings provided further insights on the feasibility of graphic medicine for health communication. First, audiences' responses to graphic medicine in both areas of mental health and vaccination frequently expressed empathy for the artists, demonstrating the relatability of this medium and indicating the potential role graphic medicine can play in building solidarity. Second, graphic medicine posts related to mental health attracted audiences to share their personal experiences and knowledge regarding the topics communicated in the comics. Comments that supportively shared experiences also appeared under vaccination-related graphic medicine posts. This finding evidenced that graphic medicine posts can encourage positive health-related behaviours. Third, comments on graphic medicine posts related to vaccination evidenced increases in knowledge comprehension and knowledge elaboration among the audience. The same category also appeared in a small number of comments on mental health posts. This finding contributes to the growing bodies of scholarship acknowledging the benefits of comics in educational and instructional settings.

Empirically, our study shed light on the strong potential of graphic medicine as a medium for effective health communication. Therefore, we hope that our study will encourage more explorations of the interplay between graphic medicine on social media and its audience. For example, building on our study, future studies may further explore the feasibility and mechanisms of graphic medicine in bringing out health-related attitudinal and behavioural changes in a more systemic way. As identified in previous studies, attitudinal change as an outcome of health communication is subject to a range of factors, such as the persuasion setting of the communication and the psychological mediators (Briñol and Petty 2006). The same applies to health-related behavioural change which is related to behavioural beliefs, efficacy beliefs, and various other factors (Fishbein and Yzer 2003). Future studies on audience responses to graphic medicine may zoom in specifically on the above

factors, which can help to predict the attitudinal and behavioural outcomes of health communication, leading to improvements in health-related communication strategies. Scaling up this study to look at a larger number of comments, a more diverse selection of audience' responses (e.g. combining comments on social media and in-depth interviews), or audiences' responses to graphic medicine circulated on social media in contexts beyond the pandemic, could offer richer and more generalised insights into the feasibility of this medium for improving health literacy, encouraging health-related pro-social behaviours, and fostering empathy and building solidarity in times of global crisis.

Concerning policymaking, our research findings, along with others' evidence of the benefits of both graphic medicine and social media for health communication, suggest that regulatory policies should focus not only on asking platforms to suppress and flag dis/misinformation but also to help tag and amplify evidence-based health communication posts. This amplification can be rolled out not only to authorial sources (as we saw happen with major health organisations during the pandemic) but also to recognised users - such as graphic medicine artists - who engage in evidence-based health communication. About this, we would suggest that more public resources be put toward investigating and developing active, creative communities of practice that can further enhance best practices in evidence-based health communication on social media.

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Appendix 1. The criteria used for data scraping.

Covid-19 Hashtags	Pandemic Hashtags	Authors	International Community Hashtags
covidcomics	lockdowncomic	Pilot sample	Graphicmedicine
covidcomic	lockdowncomics	Instagram saves	Comicsforgood
covid19comic	pandemiccomic	GraphicMedicine.org	
covid19comics	pandemiccomics		
coronaviruscomic	virsucartoon		
coronaviruscomics	viruscartoons		
coronacomic	quarantinecomic		
coronacomics	quarantinecomics		

Appendix 2. Information about the sampled comics in the area of mental health.

No.	url to the sample/comics	Instagram handle	Number of comments shown on Instagram
1	https://www.instagram.com/p/CAMS11ZB_gH	malakagharib	36
2	https://www.instagram.com/p/B-wnUGYjy7z	mardou_draws	43
3	https://www.instagram.com/p/B_n_Hlgjixa	ad_illustrates	29
4	https://www.instagram.com/p/B-Cw2Rsjawj	darcyripley	39
5	https://www.instagram.com/p/B9427dThG_q	sarahmirk	31
6	https://www.instagram.com/p/CH9PJ4wjPyu	ad_illustrates	63
7	https://www.instagram.com/p/CDCaNKmpezA	kevinsherry_	37
8	https://www.instagram.com/p/CLRuhMdJ2-O	madelynfrostarts	121
9	https://www.instagram.com/p/CATzHfgj41v	jean_guo	27
10	https://www.instagram.com/p/CMLqazIDifx	kimtku	33
11	https://www.instagram.com/p/CD9HjScBDtO	theseahorsie	45
	Number of total shown comments		504
	Number of sampled comments		334

Note: The number of comments shown on Instagram includes the number of replies, and these numbers are as of 10 October 2021 when we started data collection.

Appendix 3. Information about the sampled comics in the area of vaccination.

No.	url to the sample/comics	Instagram handle	Number of comments shown on Instagram
12	https://www.instagram.com/p/CKv60QPISmF	maaike.hartjes	104
13	https://www.instagram.com/p/CMEkejxl9YB	rachaellhouse	32
14	https://www.instagram.com/p/B_Fxz1kITs6	monachalabi	84
15	https://www.instagram.com/p/CI4TGZfA50C	drhensays	41
16	https://www.instagram.com/p/CH-FLnAIUEg	maaike.hartjes	37
17	https://www.instagram.com/p/CMUK6J0FZo1	maaike.hartjes	62
18	https://www.instagram.com/p/CJtnvwch_Xq	bluedoll.chronicles	26
19	https://www.instagram.com/p/CKuLq8VBvBb	doctorwarsgame	34
20	https://www.instagram.com/p/CKZaKo_Bavg	doctorwarsgame	67
21	https://www.instagram.com/p/CKYvg_PlytN	maaike.hartjes	28
	Number of total shown comments		515
	Number of sampled comments		159

Note: The number of comments shown on Instagram includes the number of replies, and these numbers are as of 10 October 2021 when we started data collection.