



COVID-19 Health Posters: Evaluating Visual Attention and Health Belief Model Components Using Eye-Tracking Technology

Nurbaiti¹✉, Salman Izzuddin², Haikal Djauhari²

¹ Department of Radiodiagnostic and Radiotherapy, Poltekkes Kemenkes Jakarta II, South Jakarta, DKI Jakarta, Indonesia

² Department of Data Science, Muhammadiyah Saintek University, East Jakarta, DKI Jakarta, Indonesia

Article Info

Article History:

Received:

24 April 2026

Revised:

21 June 2026

Accepted:

29 June 2026

Published:

30 July 2026

Keywords:

Eye Tracking

Health Promotion

Poster Design

COVID-19

Abstract

During the COVID-19 pandemic, health posters became a strategic medium for promoting healthy behavior, especially when direct social interaction was limited. However, the effectiveness of delivering effective messages visually through posters has not been evaluated objectively through a neurocognitive approach. This study aimed to analyze people's visual attention to two COVID-19 health posters in Indonesia using eye-tracking technology and interpret the findings according to the Health Belief Model (HBM). This study is a descriptive study involved 39 young adult participants (aged 15–55 years) who were purposively selected in Bandung. Research data were collected using the Tobii X120 tool and analyzed based on total fixation time (TFT), fixation count (FC), and heatmap visualization of 22 areas of interest (AOI) on the two posters. The results study shows that the first poster "Semua Pakai Masker" had the highest FC and TFT on the title and main visual icon, reflecting a focused and hierarchical pattern of visual attention. The second poster, "Jaga Diri dan Keluarga Anda dari COVID-19 dengan Germas" showed a scattered distribution of visual attention, with dominance at the top. The second poster had a more comprehensive coverage of the HBM message but was less visually focused. The institutional logo tended to be ignored in both posters. In conclusion, posters with simple designs and strong visual cues are more attractive and more effective in conveying key messages. The integration of eye-tracking technology and HBM theory provides new insights into the development of evidence-based health promotion media that may support behavioral change intentions.

Citation:

Nurbaiti, N., Izzuddin, S., & Djauhari, H. (2026).

COVID-19 Health Posters: Evaluating Visual Attention and Health Belief Model Components Using Eye-Tracking Technology.

MEDICA (International Medical Scientific Journal), 8(7), 564–575.

<https://doi.org/10.53770/medica.v8i7.976>

© 2026 Borneo Scientific Publishing

Corresponding Author:

✉ Nurbaiti

Department of Radiodiagnostic and Radiotherapy, Poltekkes Kemenkes Jakarta II, South Jakarta, DKI Jakarta, Indonesia

Email: nurbaiti@poltekkesjkt2.ac.id

1. INTRODUCTION

The COVID-19 pandemic posed significant global public health challenges, prompting urgent dissemination of preventive messages through health promotion media (Stenseth et al., 2021; Van Ginneken et al., 2022). In Indonesia, visual media such as posters were rapidly adopted to convey behavioral guidance, especially amid restrictions on physical gatherings (Apriliyanti, Utomo, & Purwanto, 2022; Van Den Broucke, 2020). These posters, prominently distributed through public spaces and digital platforms, served as accessible tools to promote health precautions like hand washing, mask-wearing, and social distancing (Akbar et al., 2021; Sekretariat Negara RI, 2020). However, the actual effectiveness of these materials in attracting visual attention and conveying key messages has not been rigorously evaluated using neurocognitive tools.

As a form of visual communication, posters leverage both visual and verbal stimuli to reinforce memory and comprehension, aligning with Dual Coding Theory (De Moraes, 2013; Paivio, 1991). Eye tracking has emerged as a valuable method in cognitive neuroscience to objectively measure visual attention and behavioral response by capturing metrics such as fixation count (FC) and total fixation time (TFT) (King et al., 2019; Lee & Ahn, 2012). Although widely used in advertising and user experience studies (Guo et al., 2024), its application to public health media in Indonesia remains limited. This gap presents an opportunity to understand the link between poster design and viewer cognition, especially in health crises where accurate message delivery is vital (Guo et al., 2024; Soleh et al., 2021; Yoon & Syn, 2023). Eye tracking is non-invasive and records gaze points and fixation duration in real time, providing quantitative data through TFT and FC as well as qualitative data in the form of heatmaps and gaze plots (Herawati et al., 2016; Hyokki, 2012; King et al., 2019; Lee & Ahn, 2012).

Effective poster design requires harmony among all visual elements, including integration of images and text, color choices, color contrast, white space, lay out, and illustrative content (Rosli, 2018). Posters for health promotion in Indonesia must consider simple but attractive visual designs, large fonts, and icons to replace lengthy text, given disparities in health literacy and information access among the Indonesian population (Andayani, 2020; Hadisiwi & Suminar, 2016; Oktarina, 2020; Pedwell et al., 2017). Based on the principle of visual hierarchy, a well-designed poster directs viewers to key messages first, and visual elements are processed in a pattern that is relatively consistent across individuals (Urano et al., 2019; Urano et al., 2021). During the COVID-19 pandemic, poster media were widely distributed in public spaces, health facilities, and social media as tools for communication, information, and public education (Akbar et al., 2021; Apriliyanti, Utomo, & Purwanto, 2022).

This study applied the Health Belief Model (HBM) to analyze visual elements of two official COVID-19 posters, interpreting how perceived susceptibility, perceived severity, perceived benefit, self-efficacy, and cues to action manifest in viewer attention (Jones et al., 2015; Zewdie et al., 2022). The HBM explains that risk perception, self-efficacy, and behavioral attitudes influence health behavior, and strong health promotion communication can reinforce HBM components (Zewdie et al., 2022). Recent research supports the efficacy of HBM-based visual messaging in increasing behavioral intentions (Jia et al., 2024; Liu et al., 2022). However, visual complexity, font readability, and message density can hinder engagement, particularly among groups with low health literacy or older adults (Aung et al., 2020; Andayani, 2020).

Academic studies using eye-tracking methods to evaluate health promotion media in Indonesia are still limited. Most studies have focused on evaluating subjective content or perceptions without exploring in more detail how audiences process the information visually. The novelty of this study lies in the integration of objective eye-tracking analysis

with Health Belief Model evaluation to assess COVID-19 poster effectiveness – a combined approach that has not previously been applied to Indonesian public health media. This study fills the research gap by objectively analyzing people's visual attention to COVID-19-themed health posters using eye tracking, evaluating which poster elements attracted the most attention, and interpreting how visual design contributes to the effectiveness of health message delivery according to HBM theory. By combining eye-tracking data and HBM interpretation, this study offers insight into how health poster design can be optimized to support behavioral change during pandemics.

2. METHODS

The study population comprised adults aged between 15 and 55 years with good visual activity, either with correctional glasses or lenses or without correction, who lived in Bandung City. A total of 40 people were initially enrolled, one participant was excluded due to failure to pass the calibration process, resulting in a final sample of 39 participants. Sampling was conducted using the purposive sampling method. This sample size was used considering the effectiveness of testing using eye-tracking instruments, in which sample sizes between 30 and 50 are generally sufficient to obtain representative visual and cognitive attention study results (King et al., 2019). All participants received compensation for their participation. Prior to data collection, all participants were informed about the study objectives and procedures, and provided written informed consent. The study protocol was conducted in accordance with ethical principles for research involving human participants. This research was conducted from October to December 2022 at the Laboratory of Work Design and Ergonomics Analysis, Parahyangan University, Bandung, Indonesia.

In this study, two posters published by the Ministry of Health were used as stimuli. These posters had been widely distributed by government and private agencies at the central and regional levels to educate the public during the COVID-19 (2020-2022), were displayed in public spaces, and shared via social media. Both posters were analyzed by marking several areas of focus, referred to as Areas of Interest (AOI). The number of AOIs was adjusted to the key elements contained in each poster, including text, images, and illustrations. Data collected by the eye-tracking method comprised heatmap visualization, total fixation time (TFT), and fixation count (FC) (Lee & Ahn, 2012).

To measure eye movement, the researchers used the Tobii X120, which was equipped with Tobii Studio 3.1.3 software. The working principle of this tool is to emit infrared light into the participants' eyes, and the infrared light receiving sensor on this tool records the reflection of eye movements (Levine, 2018). The recorded data were stored in the software and calculated to determine eye position. The eye movements were captured at a sampling frequency of 120 Hz and then processed to calculate the frequency and first fixation metrics.

The participants sat in a relaxed position with the eye distance to the computer screen approximately 60-80 cm. The computer screen size was 14 inches in color with a resolution of 360 x 720 pixels. Calibration was carried out each time a participant changed to ensure the accuracy of eye tracking measurements. The research room was well-lit and had a serene atmosphere. At the beginning of the session, participants underwent an adaption and calibration process with the eye-tracking instrument to ensure comfortable vision and compliance with Tobii X120 measurement standards.

The data measurements of the data two posters were conducted sequentially, starting with the first poster followed by the second. The time gap between the two measurements was 20 seconds. The measurement process was carried out in the following three stages.

First stage: An instruction screen appeared with text on a black background, informing the participant what to do during the measurement. This screen was displayed for 20 seconds. Second stage: The screen displayed the posters. Poster 1 was displayed for 20 seconds, and Poster 2 was displayed for 35 seconds. The longer exposure time for Poster 2 was determined during the preparatory phase to accommodate its greater number of AOIs (13 AOIs) and higher visual complexity compared to Poster 1 (9 AOIs), thereby allowing participants adequate time to view all elements. It is acknowledged that this difference in exposure duration may influence fixation metrics and should be considered when comparing absolute TFT and FC values between the two posters. In third stage, the screen displayed text with a blackground containing closing information for 20 seconds.

AOI coding was conducted the research team based on the key visual and textual elements of each poster. To ensure consistency, AOI boundaries were defined and agreed upon by two members of the research team prior to analysis. The duration of the display of text and posters on the computer screen in this study had been analyzed during the research preparation. The measurement data for all the participants had been automatically recorded on the computer.

3. RESULTS AND DISCUSSION

There were 39 participants in the study with an age range between 15 and 55 years. One participant was excluded from the study because he did not pass the calibration process. The characteristics of the participants are in Table 1. The sample was predominantly young adults aged 15-25 years (74%), reflecting the purposive sampling approach and the availability of participants' characteristics should be noted when considering the generalizability of the findings.

Table 1. Respondent characteristics (n=39)

Characteristic	Frequency	Percentage (%)
Gender		
Man	21	56
Women	18	44
Age		
15-25	29	74
25-35	7	18
36-45	1	3
46-55	2	5

The results of measurements with eye tracking is displayed in the form of a heatmap. A heatmap is a picture or visualization of the focus of eye movement on the object being observed, which provides a useful interpretation of the eye's response to a visual stimulus. Areas that receive longer and more intense visual attention from the eye appear redder and lighter in color, while areas that tend to receive shorter and weaker visual attention are shown in darker or bluish colors.

Poster 1

Poster 1, entitled "Semua Pakai Masker" has a title in easy-to-read typography in a large and clear font, located in the top center of the poster. The use of capital letters with bright colors and large text in the same color attracted the participants' attention, and conveys the main message to be delivered.

There are several messages in Poster 1 with small illustrations and bright background colors of turquoise and white text (Figure 1-left). The composition of elements is arranged

sequentially downwards, fulfilling the visual principle of hierarchy in visual design. There is a large illustration of the "icon wanita" and "icon pria" (AOI-9), wearing a mask in a contrasting color, which attracts attention and matches the main message in the title (Eleyan, 2023).

Poster 1 was mapped into nine Areas of Interest (AOI) based on key elements or messages (Figure 1-right): AOI-1 (title), AOI-2 (logo kemenkes), AOI-3 (logo germas), AOI-4 (lindungi diri), AOI-5 (pakai masker kain), AOI-6 (jangan keluar), AOI-7 (jaga jarak), AOI-8 (sering mencuci), and AOI-9 (icon wanita and icon pria). In Poster 1, the mean TFT values were quite high and relatively equal for AOI-1, AOI-4, AOI-6, AOI-7, AOI-8, and AOI-9. The mean TFT and FC results on AOI-2 and AOI-3 showed the lowest values (Table 2). The total fixation time (TFT) was recorded for AOI-1 (poster title), which is positioned at the top of the poster with the largest text size, making it the most prominent element.

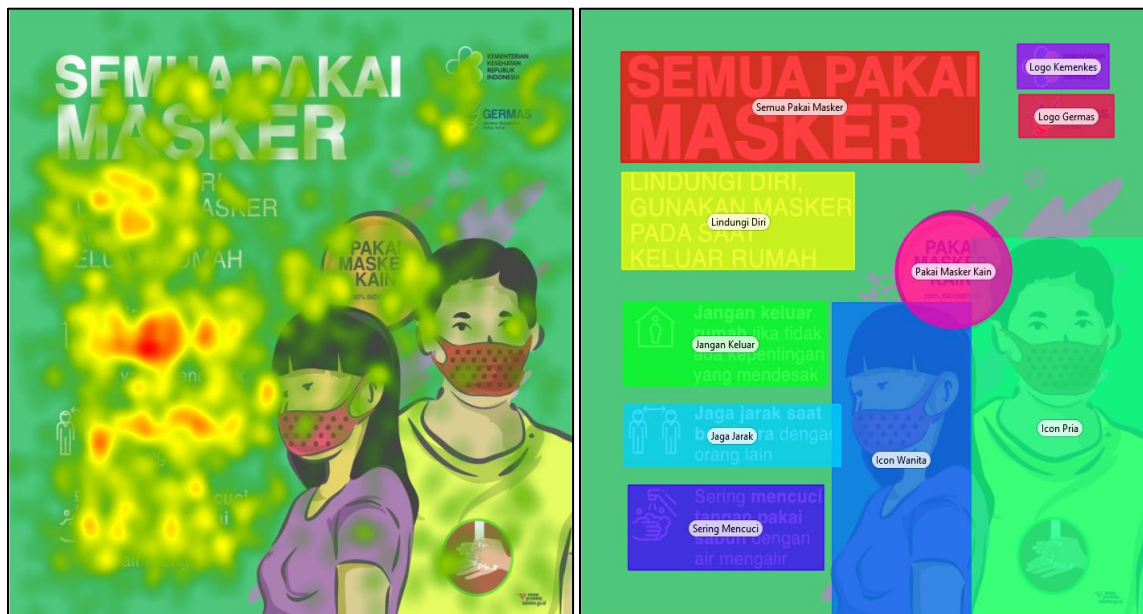


Figure 1. Heatmap of Poster 1 (left); Poster 1 has 9 AOIs (Areas of Interest)(right).

On AOI-9, the image of a man and a woman wearing a mask fills a fairly large area on the right side of the poster, making both images strong visual objects. On AOI-2 and on AOI-3, the Ministry of Health and the Germas logo are the smallest images on the poster, and are positioned in the upper left corner with less contrasting colors, which explains their lower visual attention scores.

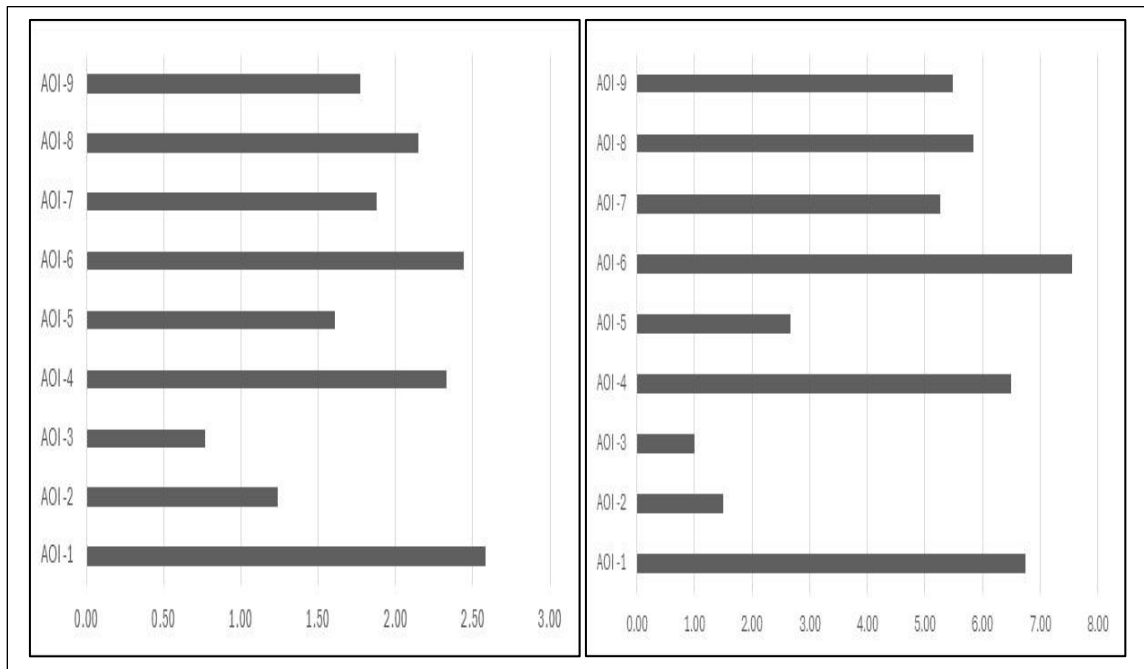


Figure 2. The Mean Total Fixation Time (TFT) of Poster 1 (millisecond)(left); The Fixation Count (FC) of Poster 1 (number)(right).

Poster 2

Poster 2 entitled "Jaga Diri dan Keluarga Anda dari COVID-19 dengan Germas" contains many messages with fewer illustrations and bright background colors (Figure 2-left). It was mapped in several areas of interest (AOI) based on key elements or messages conveyed. Poster 2 has 13 AOIs (Figure 2-right): AOI-1 (logo), AOI-2 (title), AOI-3 (cuci tangan), AOI-4 (gizi), AOI-5 (hindari hidung), AOI-6 (vitamin), AOI-7 (aktifitas fisik), AOI-8 (istirahat), AOI-9 (tidak merokok), AOI-10 (tutup mulut), AOI-11 (penyakit), AOI-12 (mandi), AOI-13 (desinfektan).

The heatmap of Poster 2 shows reddish coloring spreading across the top of the poster, with minimal extension to the bottom, indicating that participants tended to ignore the messages at the bottom. The title area (AOI-2) had the greatest mean TFT and FC values, while AOI-1 (logo) had the lowest fixation count value (Table 3). The remaining AOIs showed varying values, reflecting dispersed visual attention across the poster.

Poster 2 has a title in easy-to-read typography in a large and clear font, located in the top center of the poster. The use of capital letters for "Jaga Diri" and "Keluarga Anda" in red attracted participants' attention. These two phrases convey the main message. The colors dominating this poster are white and blue, contrasted with yellow as a complementary color, providing visual stimulation associated with cleanliness and tranquility – appropriate for a healthy-living promotion during the COVID-19 pandemic (Ji et al., 2020; Utoyo et al., 2021).



Figure 3. Heatmap of Poster 2 (left); Poster 2 has 13 AOIs (Areas of Interest)(right).

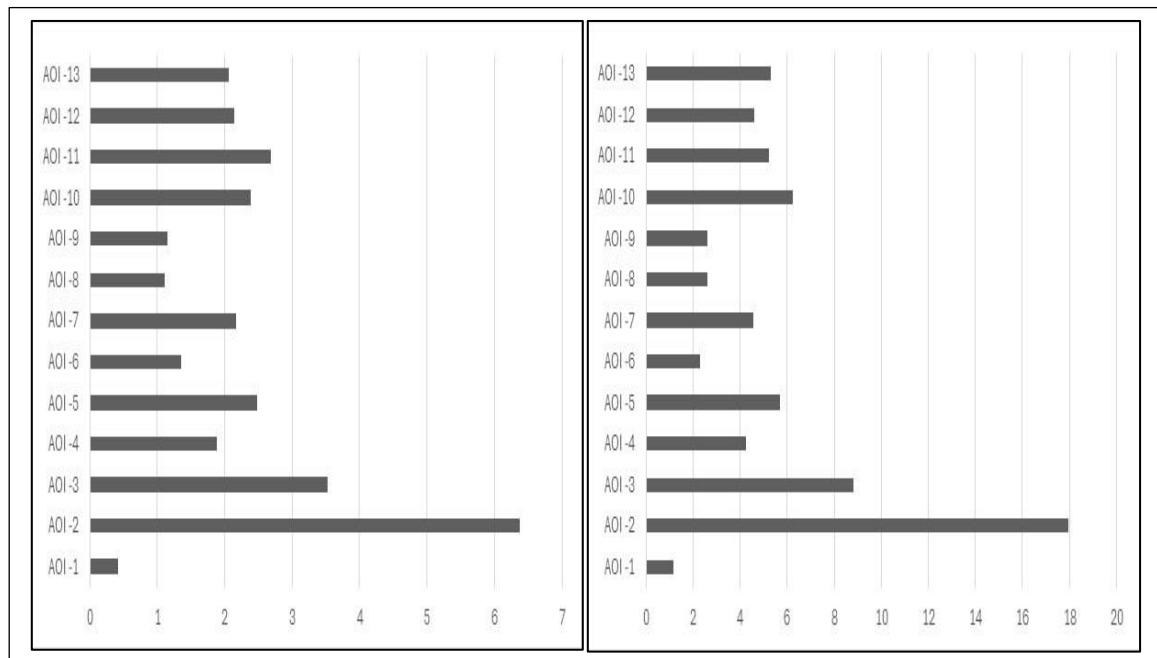


Figure 4. The Mean Total Fixation Time (TFT) of Poster 2 (milliseconds)(left); The Fixation Count (FC) of Poster 2 (number)(right).

Health Belief Model (HBM) Analysis

To understand the potential of both posters to encourage changes in health attitudes and behaviors, each poster was analyzed in terms of the six components of the HBM. The HBM classification of poster elements was conducted based on established HBM

definitions and reviewed by the research team to ensure consistent application across both posters.

Heatmaps Comparison

The heatmap results provided an overview of the participants' visual attention to the most frequently and intensely fixated parts of the poster. On Poster 1, visual attention was focused on AOI-1 (title), AOI-4 (lindungi diri), AOI-6 (jangan keluar), and AOI-8 (sering mencuci). These areas were the most prominent likely conveying the most important messages received by the participants, and their dominance reflects a strong visual hierarchy pattern.

Table 4. HBM analysis of poster 1 and poster 2.

HBM Component	Poster 1	Poster 2	Expalanation
Perceived Susceptibility	Moderate	High	Poster 2 provides more examples on risky behavior (e.g. not washing hands, smoking)
Perceived Severity	High	Moderate	Poster 1 emphasizes disease consequences via clear directive "Semua Pakai Masker"
Perceived Benefits	Moderate	High	Poster 2 outlines multiple healthy behaviors with explicit benefits
Perceived Barriers	Low	Low	Both posters avoid language or visual that imply difficulty in action
Cues to action	High	Moderate	Visual elements act as strong cues (mask, handwashing iconography)
Self-efficacy	Moderate	Moderate	Simple action verbs suggest achievability, but lack step-by-step instructions limits actual behavioral guidance for the audiences

The heatmap of Poster 2 showed a more spread-out distribution of visual intention (Figure 2-left). Red and yellow zones were observed in. Red and yellow zones were observed in AOI-2 (title), AOI-3 (Cuci Tangan), AOI-5 (hindari hidung), AOI-10 (tutup mulut), and AOI-11 (penyakit), indicating these areas were viewed more frequently. Many other AOIs appeared green, indicating they did not receive adequate visual fixation. Participants tended to ignore the message at the bottom of the poster, suggesting that the visual hierarchy of Poster 2 was weaker than that of Poster 1.

The health messages included in Posters 1 and 2 comply with the official guidelines from the Ministry of Health of the Republic of Indonesia, covering personal hygiene (hand washing, physical activity, balanced nutrition, vitamin intake), preventive measures (avoiding touching the face, covering the mouth when coughing or sneezing, surface), and self-protection after going out – all in accordance with the Germas program. However Poster 2 present too many messages, causing icons to become small and blank space to be limited. In a poster, there needs to be unity between graphic design, art, and creativity (Zheng, 2023). The elderly population may particularly have difficulty reading small illustration icons and require special considerations for health promotion media (Aung et al., 2020). It is important to effectively design COVID-19 Health Posters using various components such as text, images, illustrations, etc., because they are a medium for increasing public literacy (Yi et al., 2021).

Total Fixation Time (TFT) and Fixation Count (FC)

In Poster 2, the TFT and FC value in AOI-2 (title) were markedly higher than for the other 12 AOIs. This reflects that title's strategic position, large font, and striking color contrast. However, the high TFT may also indicate that the relative long title - "Jaga Diri dan Keluarga Anda dari COVID-19 dengan Germas" – required more cognitive processing time compared to the shorter title of Poster 1 - "Semua Pakai Masker". Higher TFT values can indicate either high engagement or increased processing effort due to visual complexity (Lee & Ahn, 2012).

The area with the lowest TFT and FC values on both posters were those containing the Germas and Ministry of Health logos, placed in the top-corner with less contrasting color and limited space. A low TFT value indicates that participants spent little observing that AOI, suggesting the information was considered less important or was visually unattractive. A low FC value indicates that the AOI did not draw the participants' gaze effectively. As part of the COVID-19 information content, the Ministry of Health logo may be either less relevant to participants' immediate needs or insufficiently prominent in its design. These results highlight the importance of strategic placement and visual contrast for institutional branding elements in public health posters.

The results of TFT analysis for Poster 2, apart from AOI-2, showed varying values among the other 12 AOIs. This indicates that participants did not distribute equal attention across the poster. AOIs with larger TFT values - namely AOI-3 (cuci tangan), AOI-5 (hindari hidung), AOI-10 (tutup mulut), and AOI-11 (penyakit) - could more effectively attract attention, while, the other AOIs were less effective in capturing participants' visual attention. The heatmap, TFT, and FC results were consistent with each other, reinforcing the validity of the findings.

Health Belief Model (HBM) Analysis

The eye-tracking results revealed different visual attention patterns on the two Covid-19 health posters. Poster 1 ("Semua Pakai Masker") showed a more focused visual attention pattern, with high TFT, and FC values on AOI-1 (title) and AOI-8 (icon wanita and icon pria). According to the HBM framework, these elements function as effective "cues to action" that encourage direct cognitive engagement (Jones et al., 2015). The clear and simple message of Poster 1 also reflects strong perceived severity by emphasizing the imperative to wear masks as a critical-protective action.

In contrast, the title of Poster 2 ("Jaga Diri dan Keluarga dengan Germas") showed a more diffuse attention pattern, with a visual concentration at the top (AOI-2) and minimal attention at the bottom. Although Poster 2 includes more HBM components - such as higher perceived susceptibility, perceived benefit, and comparable self-efficacy) - its dense layout with many small illustrations may compromise visual priority and message retention. It is important to note that TFT and FC capture visual attention rather than comprehensive or behavioral change. Interpretation of poster effectiveness in this study should therefore be understood as reflecting attentional engagement rather than direct evidence of health behavior outcomes (King et al., 2019). Future health poster designs can be improved by combining components of behavioral theory with visual design principles such as visual hierarchy, lay out simplicity, and strategic use of icons to achieve optimal health communication (Jones et al., 2015; Masarwa et al., 2023).

4. CONCLUSION

This study showed that integrating cognitive science (eye-tracking) and behavioral theory (HBM) approaches provides a comprehensive evaluation method for the

effectiveness of visual health media. Poster 1 more effectively attracted visual attention and conveyed a clear health message, strengthening the perception of disease seriousness (perceived severity), and triggering action (cue to action). Poster 2, while rich in educational and stronger in perceived susceptibility and perceived benefit components, had difficulty capturing visual attention and maintaining message clarity, due to its dense layout.

These findings suggest that future health poster designs should prioritize a simple visual hierarchy, a concise and prominent title, high-contrast colors, and large representative icons, while limiting the number of messages per poster to avoid visual overload. Specifically, institutional logos should be repositioned or enlarged to improved their visibility. It should be noted that this study measured visual attention as a proxy for communication effectiveness, and behavioral changes was not directly evaluated. Claims regarding the impact of poster design on health behavior should therefore be interpreted cautiously. Future studies should include measures of message comprehension, recall, and behavioral intention to provide a more complete picture of health communication effectiveness.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Nurbaiti conceived and designed the study, collected and analyzed the data, interpreted the findings, and drafted the manuscript. Haikal Djauhari contributed to the study design, supervised the research process, critically reviewed the analysis and interpretation of the findings, and revised the manuscript. Salman Izzuddin Amir contributed to the interpretation of the findings from a sociocultural perspective, critically revised the manuscript for important intellectual content, and provided scientific input throughout the study. All authors read and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

ACKNOWLEDGEMENT

The authors would like to thank the Director of Poltekkes Kemenkes Jakarta II and the Head of the Laboratory of Work Design and Ergonomics Analysis, Parahyangan University, Bandung, Indonesia, for their support during the study.

FUNDING

This research was funded by Poltekkes Kemenkes Jakarta II, Ministry of Health of the Republic of Indonesia, through the 2022 Early-Career Research Grant Scheme, under Grant No. HK.02.03/I/0082/2022. The funder had no role in the study design, data collection, analysis, or interpretation, manuscript preparation, or the decision to publish the results.

DECLARATION OF ARTIFICIAL INTELLIGENCE USE

Generative artificial intelligence (AI) was used solely to improve the language, grammar, readability, and organization of the manuscript. All scientific content, study design, data collection, data analysis, interpretation of the findings, and final manuscript preparation were performed by the authors. The authors take full responsibility for the accuracy, originality, and integrity of the manuscript.

REFERENCES

Akbar, G. G., Kurniadi, D., & Nurliawati, N. (2021). Content analysis of social media: public

- and government response to COVID-19 pandemic in Indonesia. *Jurnal Ilmu Sosial Dan Ilmu Politik*, 25(1), 16–31. <https://doi.org/10.22146/jsp.56488>
- Andayani, T. R. (2020). Sumber informasi serta dampak penerapan pembatasan sosial dan fisik pada masa pandemi COVID-19: Studi eksploratif di Indonesia. *Jurnal Psikologi Sosial*, 19(2), 11–121. <https://doi.org/10.7454/jps.2021.13>
- Apriliyanti, I. D., Utomo, W. P., & Purwanto, E. A. (2022). Examining the policy narratives and the role of the media in policy responses to the COVID-19 crisis in Indonesia. *Journal of Asian Public Policy*, 15(3), 541–557.. <https://doi.org/10.1080/17516234.2021.1954770>
- Aung, M. N., Yuasa, M., Koyanagi, Y., Aung, T. N. N., Moolphate, S., Matsumoto, H., & Yoshioka, T. (2020). Sustainable health promotion for the seniors during COVID-19 outbreak: A lesson from Tokyo. *Journal of Infection in Developing Countries*, 14(4), 328–331. <https://doi.org/10.3855/JIDC.12684>
- De Moraes, C. G. (2013). Anatomy of the visual pathways. *Journal of glaucoma*, 22, S2–S7. <https://doi.org/10.1097/IJG.0b013e3182934978>
- Eleyan, A. (2023). The Effect of computer-based graphic design on illustration in poster design in the 20th century. *Journal of Art and Design*, 3(1), 1–11. <https://doi.org/10.31586/jad.2023.524>
- Guo, R., Kim, N., & Lee, J. (2024). Empirical insights into eye-tracking for design evaluation: applications in visual communication and new media design. *Behavioral Sciences*, 14(12), 1–24. <https://doi.org/10.3390/bs14121231>
- Hadisiwi, P., & Suminar, J. R. (2016). Literasi kesehatan masyarakat dalam menopang pembangunan kesehatan di Indonesia. *Prosiding Seminar Nasional Komunikasi*, 344–351.
- Herawati, Y., Halim, S., & Tesavrita, C. (2016). Evaluasi website rakuten Indonesia dengan eyetracking usability testing. *Jurnal Rekayasa Sistem Industri*, 5(1), 60. <https://doi.org/10.26593/jrsi.v5i1.1914.60-68>
- Hyokki, S. (2012). Eye tracking in user research. *Interdisciplinary Studies Journal*, 1(4), 65. <https://doi.org/10.2307/41739506>
- Ji, Q., Zhao, Y., & Liu, L. (2020). Analysis of color language in poster design. *Advances in Intelligent Systems and Computing*, 952, 250–262. https://doi.org/10.1007/978-3-030-20441-9_27
- Jia, X., Ahn, S., Seelig, M. I., & Morgan, S. E. (2024). The role of health belief model constructs and content creator characteristics in social media engagement: insights from COVID-19 vaccine tweets. *Healthcare (Switzerland)*, 12(18). <https://doi.org/10.3390/healthcare12181845>
- Jones, C. L., Jensen, J. D., Scherr, C. L., Brown, N. R., Christy, K., & Weaver, J. (2015). The health belief model as an explanatory framework in communication research: exploring parallel, serial, and moderated mediation. *Health communication*, 30(6), 566–576. <https://doi.org/10.1080/10410236.2013.873363>
- King, A. J., Bol, N., Cummins, R. G., & John, K. K. (2019). Improving visual behavior research in communication science: an overview, review, and reporting recommendations for using eye-tracking methods. *Communication Methods and Measures*, 13(3), 149–177. <https://doi.org/10.1080/19312458.2018.1558194>
- Lee, J. W., & Ahn, J. H. (2012). Attention to banner ads and their effectiveness: An eye-tracking approach. *International Journal of Electronic Commerce*, 17(1), 119–137. <https://doi.org/10.2753/JEC1086-4415170105>
- Liu, J., Yang, X., Lu, Y., & Zheng, X. (2022). The joint effects of social norm appeals and fear appeals in COVID-19 vaccine campaign posters on self-perceived communication quality and vaccination intention. *Frontiers in Psychology*, 13, 1–8. <https://doi.org/10.3389/fpsyg.2022.760146>

- Masarwa, D., Niazov, Y., Ben Natan, M., & Mosovoy, D. (2023). The role of parental health beliefs in seeking an eye examination for their child. *BMC Ophthalmology*, 23(1), 269. <https://doi.org/10.1186/s12886-023-02994-2>
- Oktarina, D. (2020). Literasi kesehatan di tengah pandemi. *Journal of Chemical Information and Modelling*, 21(1), 1–5.
- Paivio, A. (1991). *Dual coding theory: Retrospect and current status*. Canadian Journal of Psychology/Revue canadienne de psychologie, 45(3), 255. <https://doi.org/10.1037/h0084295>
- Pedwell, R. K., Hardy, J. A., & Rowland, S. L. (2017). Effective visual design and communication practices for research posters: Exemplars based on the theory and practice of multimedia learning and rhetoric. *Biochemistry and Molecular Biology Education*, 45(3), 249–261. <https://doi.org/10.1002/bmb.21034>
- Rosli, H. (2018). The element of poster design: content visual analysis of Malaysian's health campaign poster. *International Journal of Multidisciplinary Thought*, 7(3), 305-316.
- Sekretariat Negara RI. (2020). *Instruksi Presiden (Inpres) nomor 6 tahun 2020 tentang peningkatan disiplin dan penegakan hukum protokol kesehatan dalam pencegahan dan pengendalian corona virus disease 2019*. <https://peraturan.bpk.go.id/Details/142625/inpres-no-6-tahun-2020>
- Soleh, M. B., Anisa, Y. H., Absor, N. F., & Edison, R. E. (2021). Differences of visual attention to memes: an eye tracking study. In *1st Annual International Conference on Natural and Social Science Education (ICNSSE 2020)* (pp. 146-150). Atlantis Press. <https://doi.org/10.2991/assehr.k.210430.022>
- Stenseth, N. C., Dharmarajan, G., Li, R., Shi, Z. L., Yang, R., & Gao, G. F. (2021). Lessons learnt from the COVID-19 pandemic. *Frontiers in Public Health*, 9, 694705. <https://doi.org/10.3389/fpubh.2021.694705>
- Urano, Y., Kurosu, A., Henselman-Petrusek, G., & Todorov, A. (2021). *Visual hierarchy relates to impressions of good design*. <https://doi.org/10.31234/osf.io/hksf9>
- Urano, Y., Kurosu, A., & Todorov, A. (2019). *Good visual hierarchy is good design*. <https://ourapps.princeton.edu/uploads/190805104123-A-3176.pdf>
- Utoyo, A. W., Aprilia, H. D., Kuntjoro-Jakti, R. A. D. R. I., & Kurniawan, A. (2021). Visual communication design: Poster as an important way to encourage social distance in Jakarta when the epidemic 19. *IOP Conference Series: Earth and Environmental Science*, 729(1), p. 012140. <https://doi.org/10.1088/1755-1315/729/1/012140>
- Van den Broucke, S. (2020). Why health promotion matters to the COVID-19 pandemic, and vice versa. *Health Promotion International*, 35(2), 181-186. <https://doi.org/10.1093/HEAPRO/DAAA042>
- Van Ginneken, E., Webb, E., Maresso, A., & Cylus, J. (2022). Lessons learned from the COVID-19 pandemic. *Health Policy*, 126(5), 348. <https://doi.org/10.1016/j.healthpol.2022.04.004>
- Yi, M., Bao, D., & Mo, Y. (2021). Exploring the role of visual design in digital public health safety education. *International Journal of Environmental Research and Public Health*, 18(15), 7965. <https://doi.org/10.3390/ijerph18157965>
- Yoon, J. W., & Syn, S. Y. (2023). The effects of visual formats on facebook health-related posts: evidence from eye movement analysis. *Library Hi Tech*, 41(3), 833–852. <https://doi.org/10.1108/LHT-10-2021-0360>
- Zewdie, A., Mose, A., Sahle, T., Bedewi, J., Gashu, M., Kebede, N., & Yimer, A. (2022). The health belief model ' s ability to predict COVID-19 preventive behavior : A systematic review. *SAGE Open Medicine*, 10, 1–10. <https://doi.org/10.1177/20503121221113668>
- Zheng, S. (2023). The application and innovation analysis of graphic design in graphic poster. *Frontiers in Art Research*, 5(4), 6-11. <https://doi.org/10.25236/far.2023.050402>