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A bibliometric analysis of research trends in health communication on social media during the COVID-19 pandemic

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Abstract

Background: The COVID-19 pandemic has significantly transformed how the public accesses and disseminates health information. In this emergency context, social media emerged as a primary channel for health communication due to its ability to reach audiences quickly and widely. However, the high volume of information on social media also triggered a surge in misinformation and disinformation, potentially disrupting pandemic mitigation efforts.
Purpose: To understand how this issue evolved in the scientific literature, this study aims to analyze the trends and patterns of research on health communication through social media during the COVID-19 pandemic.
Methods: This research applies a bibliometric analysis method with a quantitative descriptive approach, utilizing the Biblioshiny application based on R to analyze 321 articles obtained from the Scopus database within the 2020–2024 period. The analysis includes annual publication trends, average citations per year, identification of key authors and journals, keyword mapping, and distribution of contributions by country and institution.
Results: The highest number of publications occurred in 2021, with dominant topics such as "COVID-19," "social media," and "public health." The United States stands out as the leading country in both publication output and citation impact, while the Journal of Medical Internet Research was identified as the most productive journal.
Conclusions: Social media plays a strategic role in health communication during the pandemic, and this study reveals the globally evolving structure and dynamics of the scientific discourse. It is expected to contribute to the development of more effective, evidence-based digital health communication policies.

Keywords:
Bibliometric
Biblioshiny
Scopus
Health communication
COVID-19

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INTRODUCTION

The global COVID-19 pandemic has significantly impacted various sectors of life, particularly the health sector. The first cases of the COVID-19 pandemic were discovered in Wuhan, China, and reported in December 2019 (Chen et al., 2020). This disease is caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) (Sharma et al., 2020). The virus spreads between individuals through two main routes: first, through direct contact with an infected person, and second, through indirect contact involving small particles such as droplets, aerosols, and fomites, leading to the contamination of surrounding objects (Wang & Du, 2020).

SARS-CoV-2 is the virus that causes COVID-19 (Coronavirus Disease 2019), a disease previously unknown in the medical world. The prevention and management of COVID-19 can be achieved by breaking the chain of transmission by inhibiting the entry of the agent into the host. These prevention efforts include interventions against disease risk factors, including the modification of health behaviors formed through the accumulation of an individual's knowledge and attitudes toward health (Dewi, 2020).

The most palpable impact of the pandemic has been the loss of life, causing profound grief for families and communities. Furthermore, the global economy experienced a significant downturn, even leading to a recession in many countries, which worsened social inequalities and increased unemployment rates. Educational activities, reliant on direct interaction, were also disrupted, forcing a rapid transition to online learning that was not always effective for all groups. Social aspects were hampered as well, with restrictions on gatherings and mobility isolating individuals and families.

More worryingly, the pandemic triggered profound psychological impacts, such as anxiety, stress, and mental disorders, altering how society interacts and behaves and creating new challenges in recovery efforts (Hariyanto et al., 2020). In an emergency like the COVID-19 pandemic, the rapid and accurate dissemination of information becomes crucial for raising public awareness and minimizing disease spread. Social media emerged as one of the fastest and most effective media for delivering information to the public, especially health information. According to data from Our World in Data (Ortiz-Ospina, 2019), social media usage has increased significantly, with more than 4.9 billion people worldwide actively using social media in 2023.

This data shows an increase in social media users from 2.8 billion in 2017, before the pandemic. This increase accelerated during the COVID-19 pandemic when the need for digital communication and information became essential in daily life. Platforms like Facebook, YouTube, and TikTok saw notable user growth as people turned to social media for information, entertainment, and social interaction during strict lockdowns. Not only did the number of users increase, but also the frequency of social media usage.

For instance, in the United States, according to data from the Pew Research Center (Greenwood, 2024), the average adult spends over 2 hours per day on

social media, with teenagers spending up to 3-4 hours daily on platforms like YouTube and TikTok. This surging usage indicates the significant role of social media in modern life, particularly among younger generations who are more inclined to utilize technology for daily life. The increased media usage occurred not only in developed countries but was observed almost worldwide, including in developing countries. Southeast Asia, for example, experienced rapid growth in social media users due to increased technology and social media-related activities. Over 90% of Southeast Asian internet users were also active on social media as a primary channel for communication and information dissemination during the pandemic (Ortiz-Ospina, 2019).

Health communication played a vital role in disseminating health-related information during the COVID-19 pandemic. Information about the virus, prevention measures, and vaccination was spread rapidly via social media. It is important to underline that the pandemic also posed significant challenges in ensuring the disseminated information was credible and trustworthy. The spread of misinformation and disinformation on social media became a major concern, as it could cause public confusion and affect public trust in health authorities.

According to a World Health Organization (WHO) report, since the COVID-19 pandemic began, the spread of hoaxes on social media has become a dangerous information crisis. WHO noted that the phenomenon of an "infodemic" caused confusion among the public. Much baseless information about the COVID-19 virus circulated on major social media platforms. Social media also provides a space for two-way communication, meaning users not only receive information but can also respond to and spread it. This potentially increased the risk of spreading such hoaxes (Brainard & Hunter, 2020).

Health communication through social media during the pandemic has become a relevant academic issue. Research in this field is important to understand how health information is disseminated and received by the public and how social media can be used as a tool to enhance public awareness and knowledge of health issues. The increased reliance on social media during the COVID-19 pandemic raised concerns about the spread of deviant information to the public. Social media's impact extends far beyond being merely a channel for entertainment or personal communication.

One study showed that during the COVID-19 pandemic, science-based information received more retweets than false information on social media, although misinformation still spread widely (Pulido et al., 2020). This highlights the importance of better monitoring and understanding of how this information evolves on social media, as well as the role of the platforms themselves in shaping public perception. Communication is the process of using stimuli in the form of signs or symbols, such as language or non-verbal gestures, to influence the behavior of others. These stimuli can be spoken language, gestures, actions, or symbols understood by the recipient, so that the recipient provides a response or reaction according to the stimulus.

According to Liliweri, communication

can be defined as the process of transferring a message from a source to a receiver with the intention that the message can be understood. This communication process involves interaction between two parties, whether individual to individual, individual to group, or group to group (Paramasari & Nugroho, 2021). Meanwhile, health communication is an organized effort to influence the health behavior of individuals and communities by utilizing the principles and methods of communication, through interpersonal interaction, group communication, or the dissemination of messages via mass media (Paramasari & Nugroho, 2021).

Health communication through social media has been a primary focus of various studies during the COVID-19 pandemic. Social media plays a crucial role as a platform for conveying health information, improving health literacy, and reducing the risk of misinformation spread. Several relevant studies show various approaches and significant results in this context.

Research by Rukman Pala and Rachmawaty Djaffar (2022) examined patterns of social media use in accessing COVID-19 information by the Tamamaung community in Makassar. This study used a quantitative method with descriptive analysis and showed that social media like WhatsApp, Instagram, and YouTube were used optimally to convey health information. The study found that the community understood health protocols such as 3M (wearing masks, washing hands, maintaining distance) thanks to access to information from social media. Social media also functioned as an educational tool, allowing real-time interaction without face-to-face meetings.

Syaifa Tania and Harry Cahyono (2022), in their article, discussed the practice of the Social Media Pandemic Communication Model (SMPC) on the Instagram and Twitter accounts of the National Disaster Management Agency (BNPB) and the Ministry of Health. The results showed that during the first semester of the pandemic, most messages focused more on the community's psychological preparation rather than on specific instructions on how to deal with the pandemic. The study also revealed that although social media has the potential to be an effective health communication tool, its use was not yet optimal because the information conveyed remained monological, less interactive, and sometimes did not align with the pandemic phase (Tania & Cahyono, 2022). The SMPC model offers a conceptual framework guiding authorities in crafting appropriate messages based on the pandemic phase: pre-pandemic, alert, pandemic, and transition.

This study found that information in the early phase emphasized psychological adjustment, whereas the pandemic phase should have contained more instructional information (Tania & Cahyono, 2022). Another study by Arif Nugroho Triutomo and Hasan Basri Boruta (2021) highlighted the effectiveness of communication techniques and media in conveying information about COVID-19 prevention and vaccination to adolescents. This research was conducted through a community service program using socialization methods and the creation of a communication medium in the form of a poster titled "BERANI" (Bersama Remaja Tangani Pandemi/Together with

Youth Tackling the Pandemic). This poster was designed to be disseminated via social media and public places to enhance adolescent health literacy.

The study emphasized the importance of using communication media suitable for the target audience, such as posters and social media, to increase adolescents' knowledge about COVID-19. The results showed an increase in participants' understanding of health protocols and vaccination after the socialization. However, the study also identified constraints, such as limitations in the equipment owned by participants (Triutomo & Boruta, 2021).

The increased attention to health communication via social media during the COVID-19 pandemic is reflected in the high number of scientific publications on the topic. This condition indicates the need for a scientific mapping to understand the direction, trends, and contributions of the research conducted. This study aims to analyze the scholarly dynamics of health communication on social media during the pandemic through a bibliometric approach.

Research by Lisnarini et al. (2025) mapped research trends related to therapeutic communication in Indonesia from 2020–2024 using a bibliometric approach based on Google Scholar and the VOSviewer application. That study showed a connection between the theme and issues of mental health, social interaction, and the healing process. However, the scope of that research was still limited to the national context with a primary focus on therapeutic communication in general, without specifically highlighting the role of social media as a health communication medium. The data source used also did not come from an internationally recognized database like Scopus, so the global representation of scientific trends was not fully depicted. This study aims to expand that understanding by mapping research on health communication on social media during the pandemic based on Scopus data to provide a more comprehensive global perspective on scientific contributions in this field.

Zakiyyah, Winoto, and Rohanda (2022) also conducted a bibliometric mapping of the development of information architecture research using data from Google Scholar and visualization with VOSviewer. That study mapped publication trends, author collaborations, and keyword clusters, providing an in-depth understanding of the research structure in the information field. Although the topic is different, the methodology and analytical tools used are highly relevant and can strengthen the methodological framework of this study.

Although health communication through social media during the COVID-19 pandemic has been the focus of various previous studies, most are still limited to descriptive approaches regarding usage patterns or the effectiveness of social media as a message delivery channel. For example, the study by Pala & Djaffar (2022) emphasized the behavior of local communities in accessing information via social media, while research by Tania and Cahyono (2022) highlighted government communication strategies but has not comprehensively examined how global trends and contributions in this realm have evolved over time. Furthermore, previous studies have not widely used quantitative approaches based on internationally

indexed scientific publication data, making it difficult to see the big picture of the field's scholarly development systematically.

The importance of this research is also driven by the increased use of social media across various age demographics. According to a report from the Pew Research Center (2024), about 72% of adults in the United States use social media, with approximately 80% of them accessing social media to seek health information. The impact of social media is also felt by communities that still have difficulty accessing the internet, such as in remote areas, indicating how health communication can be maximized through social media. This bibliometric research is highly relevant because it allows researchers to identify trends and patterns in the existing literature.

Using bibliometric analysis, researchers can understand how research on health communication, particularly on social media, has developed. Therefore, the research gap that this study aims to fill is the absence of a comprehensive analysis of the dynamics of health communication research on social media during the COVID-19 pandemic using a Scopus-data-based bibliometric approach. What is not fully understood from previous research is the extent to which global scientific research has developed thematically, geographically, and institutionally in examining the role of social media in health communication during the pandemic. This study addresses that question through a bibliometric approach using the R-based Biblioshiny application, which can provide a quantitative and visual scientific mapping of publication trends, researcher collaborations, institutional contributions, and thematic keyword distributions.

The objective of this research is to apply bibliometric analysis to the scientific research output indexed by Scopus on the topic of health communication through social media during the global COVID-19 pandemic, covering the period from 2020 to 2024. This timeframe was chosen because it encompasses the initial emergence of the pandemic (2020), the peak crisis period (2021), the transition phase toward endemicity (2022–2023), and the recovery and post-pandemic reflection period (2024). With this coverage, the study is expected to provide a comprehensive overview of the development of research throughout all pandemic phases and its long-term impacts. The research includes an analysis of authors, sources, countries, and publication trends. The focus of this analysis is to evaluate various elements, such as patterns of the research's development over time, key contributors to this topic, and the conceptual progress of health communication via social media.

By using bibliometric analysis, this study aims to provide profound insights into the direction and development of research related to health communication on social media platforms. This analysis not only provides a quantitative picture but also aims to understand the contextual developments in the dissemination of health communication through social media. Thus, the results of this study are expected to contribute significantly to the development of policies, practices, and resources related to health communication through social media.

RESEARCH METHODS

This study used a bibliometric analysis method with a descriptive quantitative approach. Bibliometric analysis was applied to quantify the scholarly output within the Scopus dataset pertaining to health communication via social media during the COVID-19 pandemic. Publication data were systematically retrieved from the Scopus database, selected for its comprehensive coverage, robust features, and suitability for facilitating data collection, analysis, and visualization, thereby establishing it as a standard resource for bibliographic retrieval and compilation.

The document search was conducted with a focus on scientific articles and journal publications addressing the central topic. The Boolean search query "health communication" AND pandemic AND "COVID-19" AND "social media" was executed, configured to scan for these terms within the title, abstract, and author keywords of the records. This search strategy yielded a final corpus of 321 articles published between 2020 and 2024 that met the specified criteria.

The resultant bibliographic data were exported in CSV (Comma-Separated Values) format for subsequent processing and visualization using the Biblioshiny application. Biblioshiny serves as a pivotal tool in bibliometric studies, enabling efficient data manipulation and the generation of insightful visual representations from bibliometric datasets. It is a freely accessible web interface built upon the R programming environment, which is itself an open-source software platform (Büyükkidik, 2022). Within the domain of scientific mapping, Biblioshiny has gained prominence as a leading application for conducting bibliometric and scientometric analyses.

The software provides a user-friendly interface coupled with a comprehensive suite of functions dedicated to analytical evaluation, data visualization, and graphical representation (Silva et al., 2022). In the context of this research, Biblioshiny was instrumental in analyzing the publication set, facilitating assessments of impact, productivity, and collaborative networks among countries, institutions, journals, and research domains. While native platforms like Scopus offer basic visualization capabilities, Biblioshiny affords a more granular and profound analytical depth. This capacity renders it an indispensable instrument for elucidating the dynamics of scholarly communication and identifying salient patterns within bibliometric data.

The bibliometric analysis method is a research approach that involves the quantitative assessment of bibliographic records (Sjuchro, 2023). This technique entails the statistical evaluation of publication data (Donthu et al., 2021). The approach allows for the systematic measurement of scientific impact, the identification of emergent research trends, and the mapping of collaborative networks among researchers and institutions. Through its structured framework, this methodology yields a nuanced understanding of the intellectual landscape surrounding health communication on social media during the COVID-19 pandemic.

Table 1. Summary of data source and selection criteria

Category	Specification
Research database	*Scopus*
Time frame	2020-2024
Search keywords	"*health communication" AND pandemic AND covid-19 AND "social media*"
Document type	"*Article*"
Data extraction	Rekod lengkap yang diekspor dari dataset dalam format *CSV*
Final corpus	321

Source: Primary data analysis, 2025

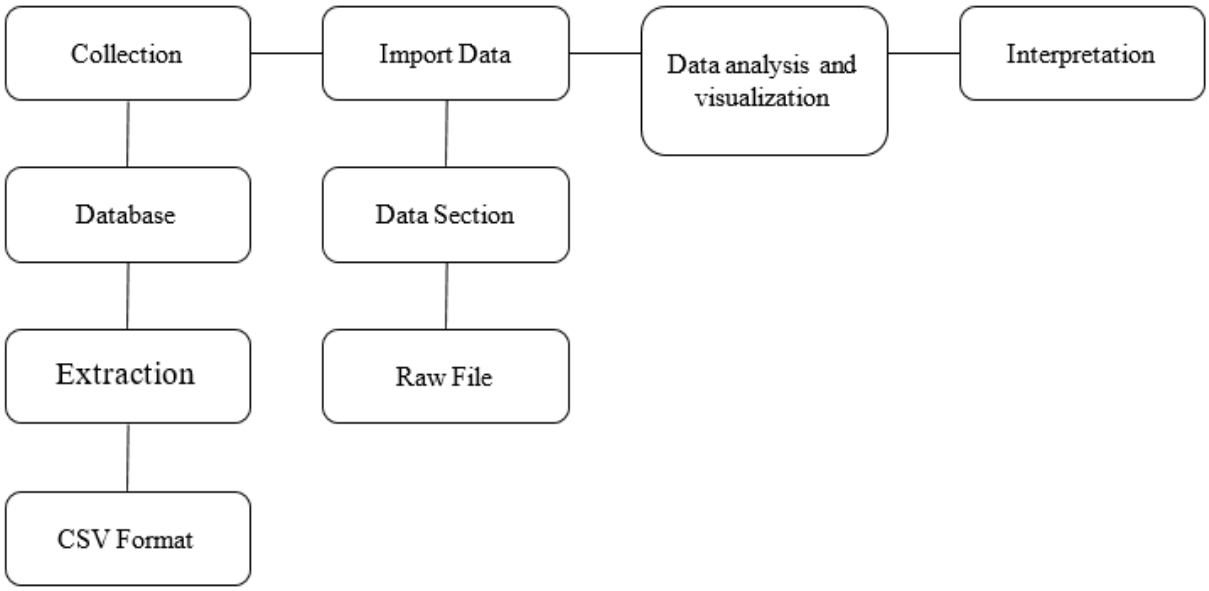

Figure 1. Research workflow

Source: Primary data analysis, 2025

RESULTS AND DISCUSSION

The search using the keywords "health communication" AND pandemic AND "COVID-19" AND "social media" in the Scopus database was conducted for the

Table 2. Main data information

Description	Information
Time span	2020-2024
Sources (journals)	162
Documents (articles)	321
Annual growth rate %	3.71%
Average document age	1.95
Average citations per document	20.49
References	14626
Authors	1934
Single-authored documents	15
Co-authored documents	6.4
International co-authorship	24.61%

Source: Processed researcher data from Biblioshiny, 2025

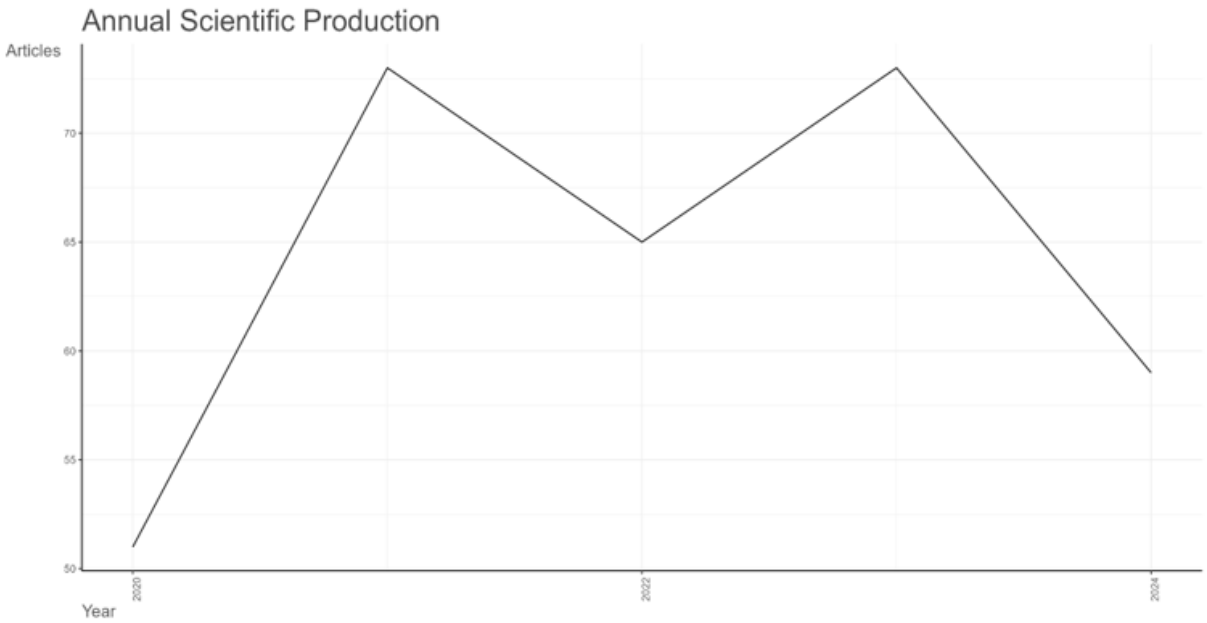

Figure 2. Annual scientific production

Source: Processed by researcher, 2025

publication years 2020 to 2024, filtered for the document type "article." The resulting research data are summarized in Table 2.

This study reviewed and processed 321 scientific articles from the Scopus dataset through bibliometric analysis. The keyword information extracted during the data extraction process formed an important foundation for the bibliometric analysis. The processed dataset was then organized and presented in visual formats that support the research objectives.

The Annual Scientific Production chart shows the trend in the number of scientific publications related to health communication through social media during the COVID-19 pandemic. In 2021, the number of publications peaked at 73 articles, a significant increase from 51 articles in 2020. After a decrease to 65 articles in 2022, the number rose again to 72 in 2023 before declining to 60 articles in 2024.

These changes in publication numbers may reflect patterns of researchers' responses to the phases of the pandemic. The year 2021, which recorded the peak of publications, may indicate the high demand for health communication research amid a still-active pandemic period. The decline in 2022 could be caused by shifting research priorities or the reduced urgency of the topic as the pandemic transitioned toward an endemic phase. The renewed increase in 2023 shows that this theme remains relevant, particularly in discussing long-term impacts and new challenges such as vaccination communication and controlling misinformation on social media.

Figure 3 shows the average citations per scientific article per year, with a trend showing a significant decrease from 2020 to 2024. In 2020, the average citations reached the highest number, approximately 10 citations, but decreased each subsequent year, reaching an average of less than 5 citations in 2024. The high number of citations in 2020 reflects the peak of global

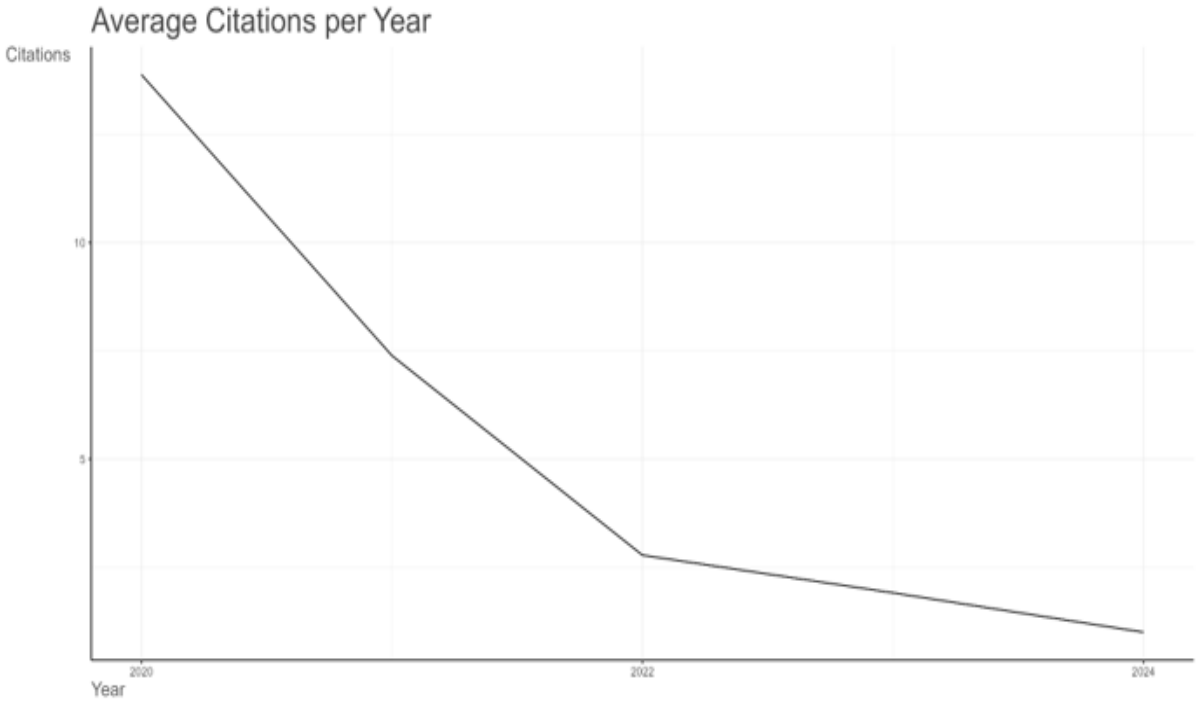

Figure 3. Average citations per year

Source: Processed by the researcher, 2025

attention on scientific research, primarily because the COVID-19 pandemic was in its most critical phase at that time. This decline may reflect a shift in research focus or the reduced urgency of topics related to the pandemic as the global situation stabilized. This data provides an overview of how social and scientific conditions can influence changes in information needs and shifts in research focus over time.

Figure 4 shows an analysis of the references used in the publications, based on Reference Publication Year Spectroscopy (RPYS). RPYS is a bibliometric method used to analyze the historical origins of a research field by analyzing the cited

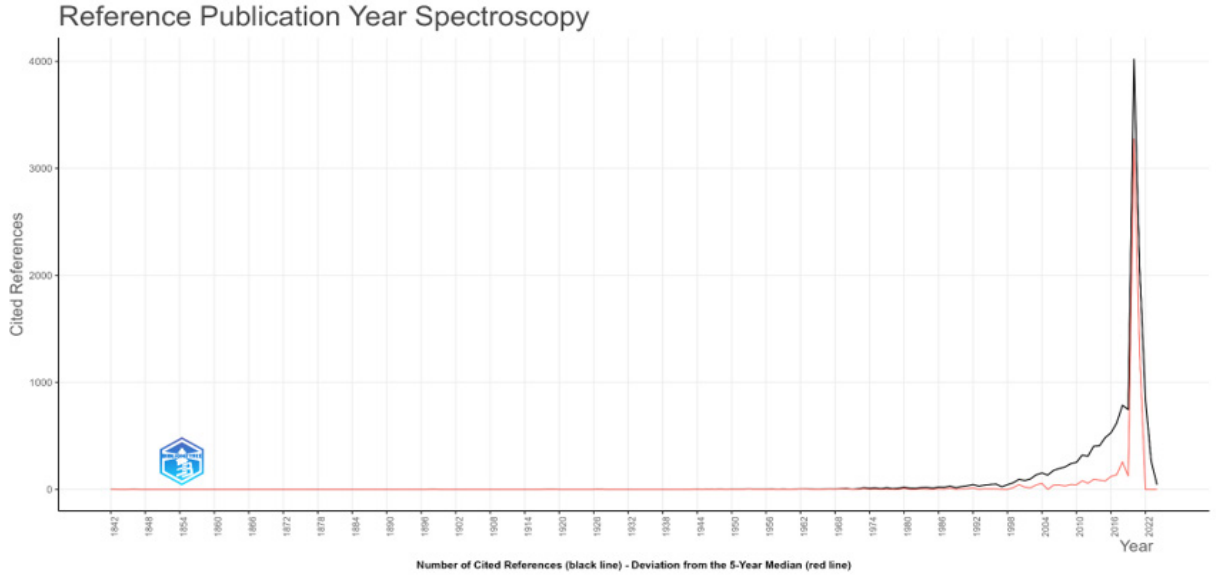

Figure 4. Reference Publication Year Spectroscopy (RPYS)

Source: Processed by the researcher, 2025

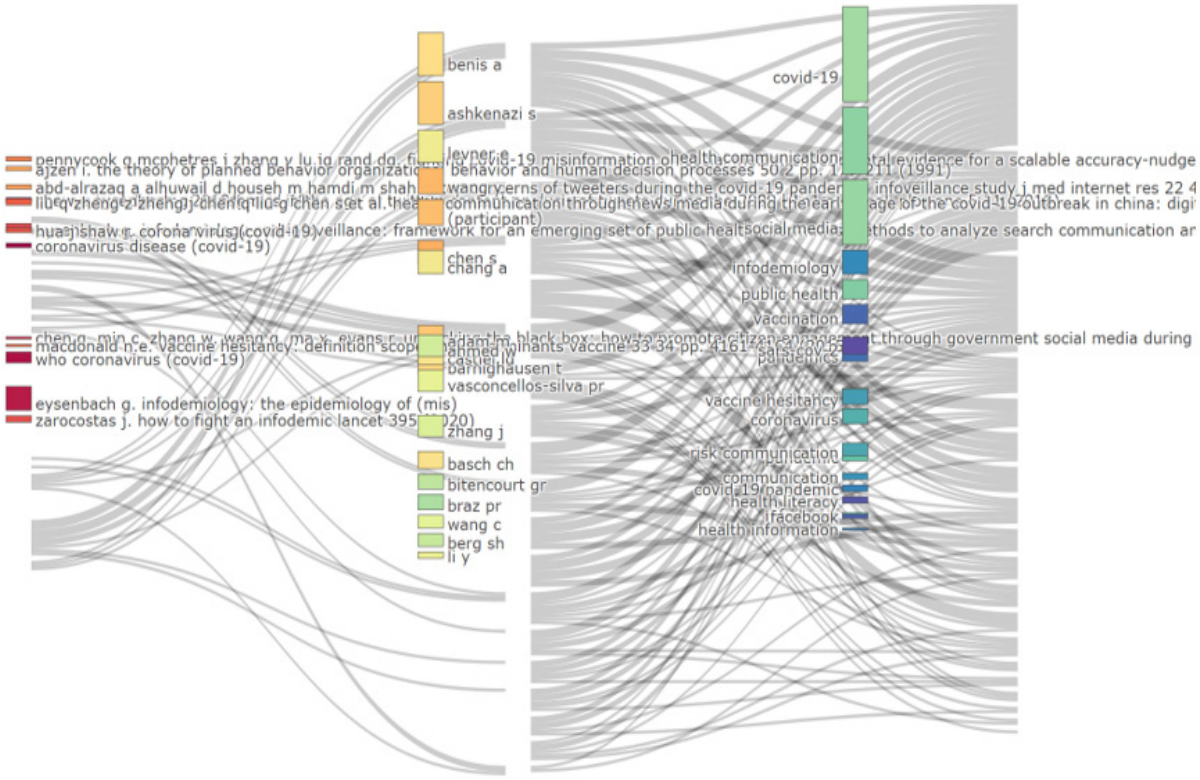

Figure 5. Three-field plot

Source: Processed by the researcher, 2025

references (CR) in publications, particularly the most frequently referenced publication years within a specific collection of scholarly works (Leydesdorff et al., 2016). Based on this analysis, the most frequently cited publication year within the references was 2021, with these references being cited approximately 4,000 times in the analyzed articles. This year demonstrates a significant influence on the development of research related to this topic.

The subsequent Three-Field analysis maps the interrelationships between journals (left), authors (center), and keywords (right). These three fields are connected by gray lines, while the box size represents the number of publications related to each respective field (Srisusilawati et al., 2021). In the left section, representing journals, 11 indexed journals that published scientific articles on the topic of health communication through social media during the COVID-19 pandemic were identified.

The central section displays the names of the authors. This analysis identified 19 top authors actively contributing to the research topic. The box size in this field illustrates the number of articles produced by each author. The right section represents the research keywords.

These keywords describe the core of the addressed topic and their relationship to authors contributing to health communication through social media during the COVID-19 pandemic. The results show 17 main keywords, with “COVID-19” emerging as the most frequently used keyword.

From the Three-Field Plot results in Figure 5, a deeper analysis reveals that the most active journals publishing articles

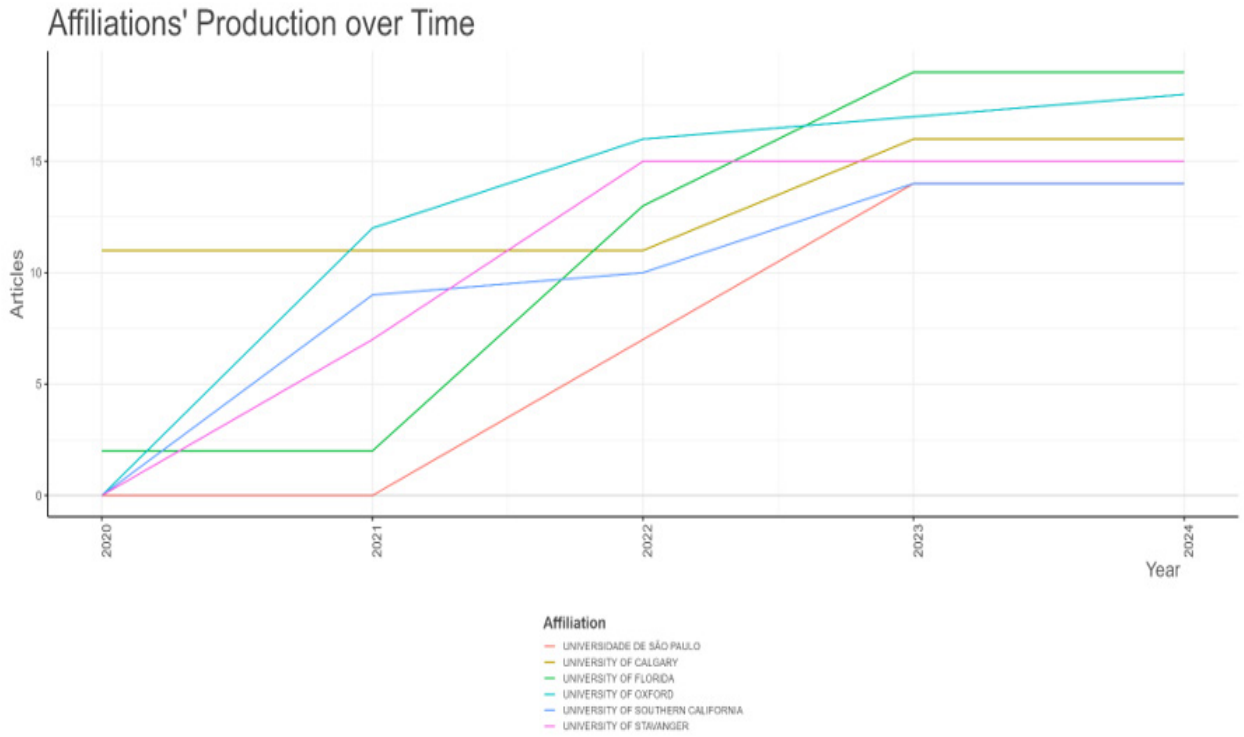

Figure 6. University production over time

Source: Processed by the reseacher, 2025

about health communication during the pandemic include the Journal of Medical Internet Research, International Journal of Environmental Research and Public Health, and Health Communication. These three journals not only occupy the top positions in publication volume but also play a crucial role in shaping the direction and focus of research in this field globally.

Meanwhile, several leading authors dominating article production include Gunther Eysenbach, known as the founder of the Journal of Medical Internet Research and a pioneer in e-health, as well as researchers such as K. Wong and C. J. Kim, who consistently write about health information dissemination and public behavior on social media during the pandemic. The involvement of these authors clarifies the concentration of expertise in digital health communication and confirms that the scientific community in this field has established productive and influential key figures.

Figure 6 presents an analysis of university contributions to the production of scientific articles related to health communication through social media during the COVID-19 pandemic over time. According to the data, the University of Florida emerged as the institution with the highest number of publications, showing consistently strong growth each year from 2021 to 2024, with more than 15 articles published in the final year. The University of Oxford holds the second position and also recorded significant growth in the number of articles produced. This pattern indicates that research on health communication on social media during the COVID-19 pandemic has grown year by year.

Figure 7 presents a bibliometric

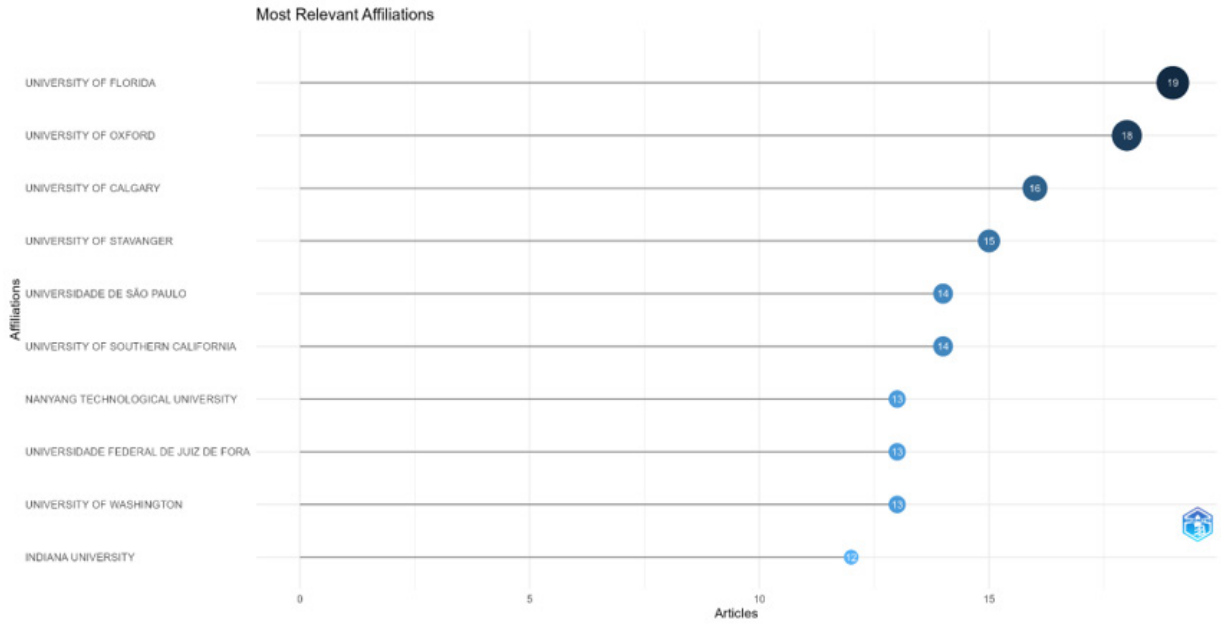

Figure 7. Most relevant universities

Source: Processed by the researcher, 2025

analysis of the most relevant affiliations, depicting university contributions worldwide in publishing articles related to health communication through social media during the global pandemic. The analysis shows that the University of Florida occupies the top position with 19 articles published in the Scopus dataset. The University of Oxford also showed significant growth, reflecting a strong commitment to this topic with consistent publication growth from 2020 to 2024.

Other universities, such as the University of Calgary, University of Stavanger, Universidade de São Paulo, University of Southern California, Nanyang Technological University, a federal university in Brazil, the University of Washington, and Indiana University, also contributed consistently with relatively similar numbers of articles. This indicates continuity and a global commitment to supporting research in health communication. The diversity of institutions spread across various countries further underscores that health communication is not merely a regional focus but has become an issue receiving international attention.

The Bradford analysis in Figure 8 produced three zones. The first zone, or core zone, comprises 8 journals with a total of 140 articles. This zone consists of journals with the highest relevance to the research topic, such as the Journal of Medical Internet Research with 23 articles and the International Journal of Environmental Research and Public Health with 21 articles. These journals serve as primary literature sources due to their substantial article contributions, averaging 17.5 articles per journal. This indicates that the core zone forms an essential information foundation for the field of health communication during the pandemic, given the high publication consistency from these journals.

The second zone encompasses journals ranked 9th to 23rd, with 15 journals

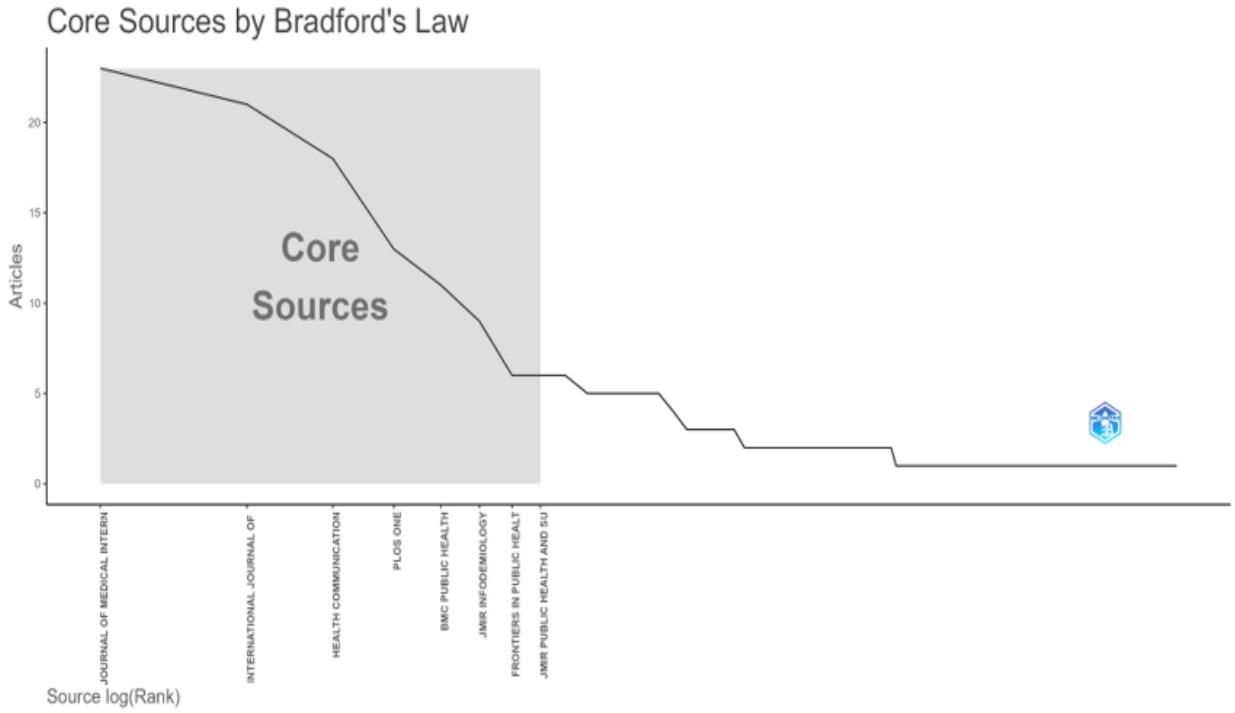

Figure 8. Journal Clustering with bradford's law

Source: Processed by the researcher, 2025

producing 110 articles. In this zone, the number of articles published per journal begins to decrease compared to the core zone, averaging about 7.3 articles per journal. This shows that although these journals remain relevant, their focus on health communication topics may not be as intensive as journals in the core zone. However, the cumulative contribution of the second zone remains substantial, reflecting a diversification of literature from journals covering various aspects of health communication during the pandemic.

The third zone includes journals ranked 24th to 43rd, with 20 journals producing 71 articles. The average contribution of about 3.6 articles per journal indicates that journals in this zone have lower relevance to the research topic. These journals likely include studies that only touch upon health communication indirectly or within a broader context. The third zone, while having the smallest contribution per journal, remains important in providing broader and complementary perspectives for understanding more complex issues in health communication.

Figure 9 provides information about the most relevant scientific journals based on the number of published articles related to health communication through social media during the global pandemic. The Journal of Medical Internet Research occupies the top position with 23 articles discussing this topic, making it the most significant reference source in the field. In the second position, the International Journal of Environmental Research and Public Health nearly matches the top position, differing by only two articles, with 21 articles. Meanwhile, Health Communication also shows a substantial contribution with 18 articles indexed in Scopus on similar topics.

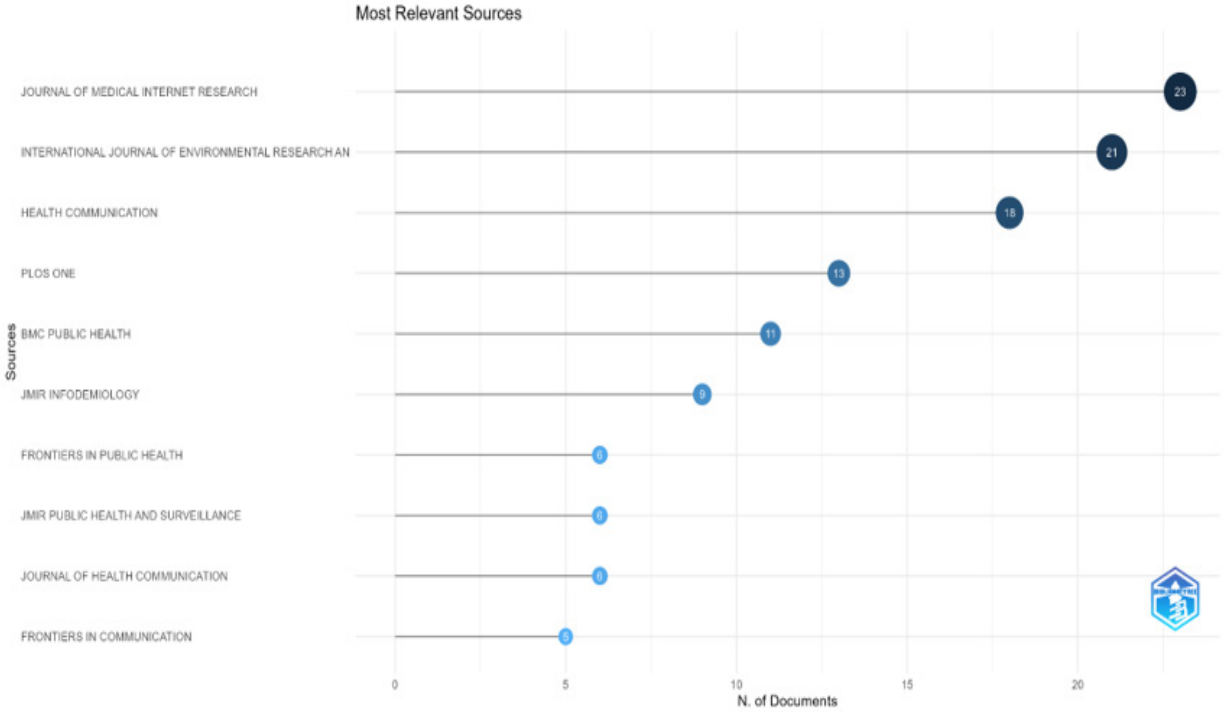

Figure 9. Most relevant journals

Source: Processed by the researcher, 2025

An analysis of these most relevant journals provides important guidance for researchers to identify scientific resources with significant influence in the field of health communication through social media during the pandemic. By understanding the relevance and impact of these journals, researchers can direct their focus to scientific literature that is not only credible but also contributes to the development of studies in this area. This information also helps in evaluating research trends and determining which journals are most suitable as references for further studies or academic collaborations.

The corresponding author's country chart in Figure 10 shows that the United States is the largest contributor to scientific article publications, both from domestic collaboration through Single Country Publications (SCP) and international collaboration through Multiple Country Publications (MCP), with a total of 122 articles published in Scopus. China occupies the second position, with the majority of its contributions coming from domestic research, while other countries such as Canada, Spain, and the United Kingdom also show significant roles with more balanced collaboration rates between SCP and MCP publications. Additionally, countries like Brazil, Italy, Australia, and India also provide important contributions, albeit with different proportions of international collaboration. Several other countries, such as Denmark, Japan, and Sweden, have smaller contributions, with most publications originating from SCP.

Figure 11 presents the countries with the highest total citations, revealing a distinct global pattern of research impact and influence in the field of health communication on social media during the pandemic. The analysis demonstrates a

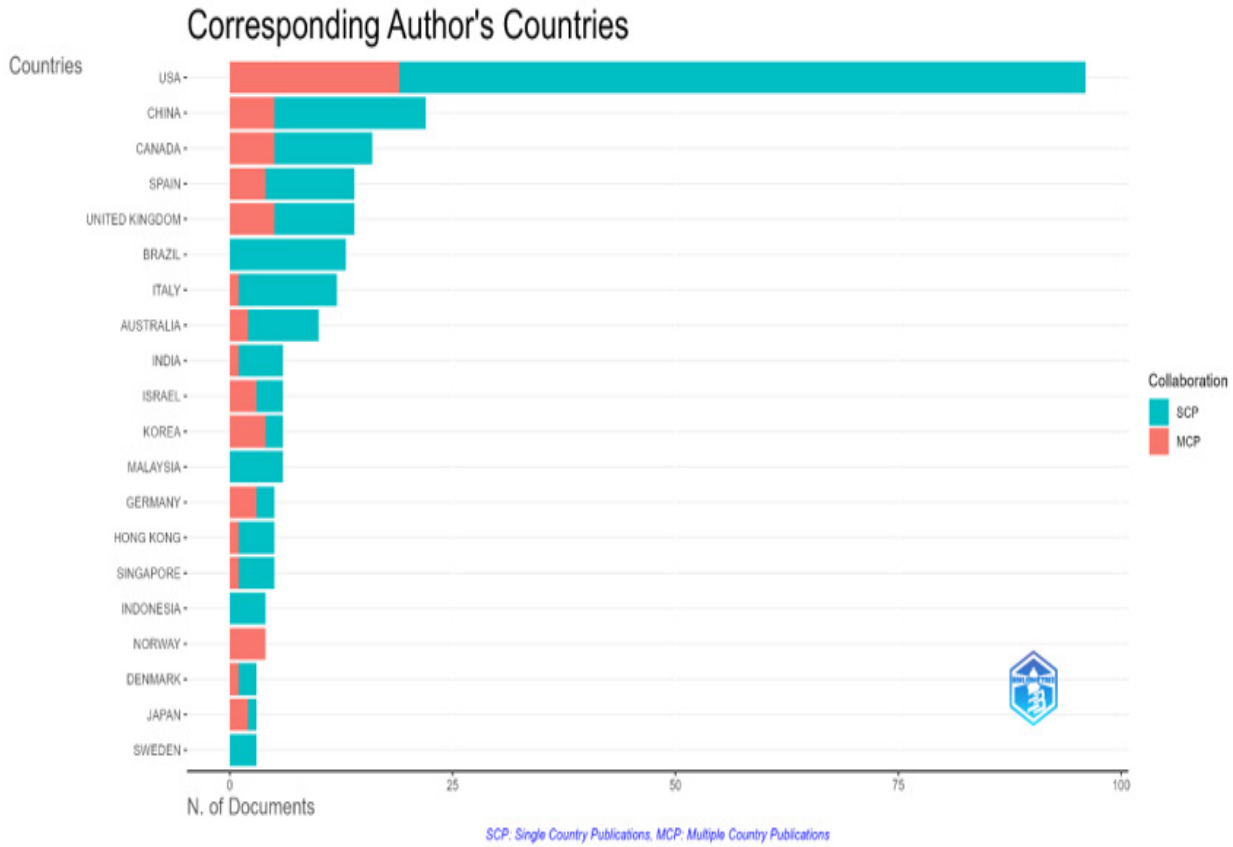

Figure 10. Corresponding author's country

Source: Processed by the researcher, 2025

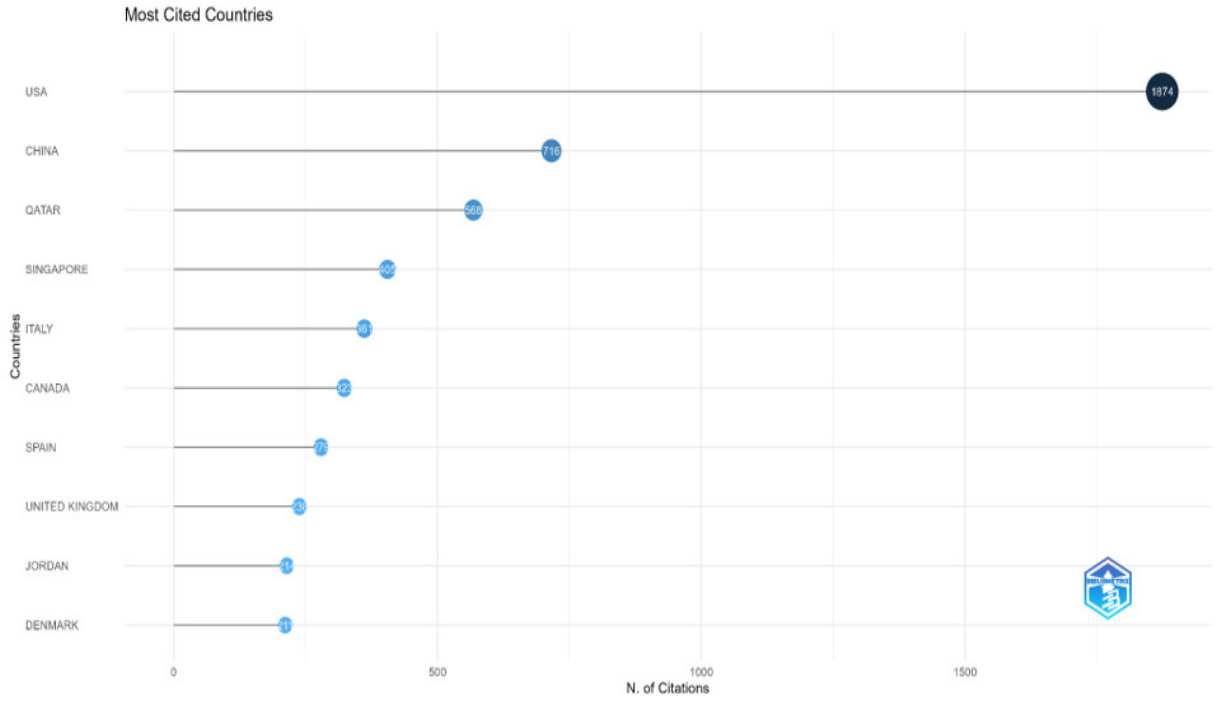

Figure 11. Most cited countries

Source: Processed by the researcher, 2025

Figure 12. ***Worldcloud***

Source: processed by the researcher, 2025

clear hierarchy of scholarly impact, with the United States (US) dominating the field by accumulating a total of 1,674 citations, far surpassing all other nations. This signifies that research originating from American institutions has been the most frequently referenced and has therefore exerted the greatest influence on the global scientific discourse.

Following the US, China occupies the second position with 716 citations, demonstrating substantial research impact despite the significant gap with the leading country. Notably, Qatar emerges as a significant contributor with 565 citations, indicating a strong research influence that surpasses many Western countries. Singapore follows with 405 citations, reflecting its active and impactful research contribution in this domain.

Other European and Western nations, including Italy, Canada, Spain, the United Kingdom, Jordan, and Denmark, complete the list of top-cited countries, though with comparatively lower citation counts. This geographic distribution highlights not only the concentration of influential research in traditional scientific powerhouses like the US but also the emergence of significant research impact from Asian and Middle Eastern countries, particularly China, Qatar, and Singapore, in addressing global health communication challenges during the pandemic.

Figure 12 shows a wordcloud generated from the bibliometric analysis of scientific articles discussing health communication on social media during the COVID-19 pandemic. This wordcloud visualizes the most frequently appearing keywords in the articles, providing an overview of the main themes that are the focus of the research. The term “social media” appears most prominent, indicating that

Figure 13. ***Treemap***

Source: Processed by the researcher, 2025

social media is a central element in health communication during the pandemic. Words such as “COVID-19,” “pandemics,” and “coronavirus disease 2019” also appear in large sizes, affirming that the context of this research is closely related to the global pandemic and its impacts.

Additionally, the words “human” and “humans” indicate strong attention to how the pandemic affects humans individually and collectively. Other words such as “public health,” “medical information,” and “epidemiology” reflect research aspects related to public health and the dissemination of medical information. Terms like “vaccination,” “misinformation,” and “trust” show a focus on specific relevant issues, including how trust in health information can influence vaccine acceptance.

Besides the wordcloud, the frequency of words or terms that frequently appear in scientific articles can also be seen through a treemap visualization. In a wordcloud visualization, the largest words are those that appear most frequently compared to smaller words. The size becomes a benchmark for determining the frequency of occurrence. Meanwhile, with a treemap visualization, the number of appearing words and their percentages can be seen; the treemap helps view data in more detail than the wordcloud.

Based on the treemap visualization above, “social media” is the most frequently appearing term with 325 occurrences and a 9% appearance rate. This shows that “social media” has the highest frequency of occurrence for this topic. The words "human," "pandemic," and "COVID-19"

each have a word appearance percentage of 6%. Differences in box sizes in the treemap are also visible, indicating that words with a high frequency of occurrence are depicted with larger boxes, while words with a lower frequency of occurrence are depicted with smaller sizes. The smaller the size, the lower the frequency of the word's occurrence.

Based on the research results, the significant increase in publication numbers in 2021, reaching 73 articles, reflects the scientific response to the peak of the pandemic crisis and the urgent need for health communication through social media. This phase coincided with the spread of the Delta variant and global vaccination campaigns that drove the need for research related to information dissemination in digital spaces.

This research not only presents quantitative findings but also reveals epistemological and structural dynamics in the development of health communication research during the pandemic. These findings indicate that this topic has become a permanent part of the global scientific agenda and will continue to evolve alongside technological changes and public health challenges.

The findings in this research generally strengthen and expand the results of previous studies in the field of digital health communication. For example, the sharply increasing publication trend in 2021 aligns with the findings of Tania and Cahyono (2022), who stated that during the early pandemic, governments and health institutions massively used social media to deliver public health messages.

This research also supports the study by Pala and Djaffar (2022), which highlighted the active role of the public in seeking and sharing health information through platforms like WhatsApp and YouTube. However, this study provides a broader contribution by systematically mapping the global patterns of these scientific publications and providing a quantitative framework for these dynamics.

Furthermore, the declining average citations per year found in this study expands on the findings of Pulido et al. (2020), who emphasized that the abundance of information on social media during the pandemic did not always correlate directly with its quality or impact on shaping academic discourse. Meanwhile, the dominance of keywords like "misinformation" and "trust" in the wordcloud and treemap strengthens the argument of Brainard and Hunter (2020) that the public health crisis during the pandemic was exacerbated by an infodemic, where the flood of misinformation on social media became a distinct challenge in public education.

CONCLUSION

The COVID-19 pandemic has fundamentally transformed the paradigm of global health communication. Social media platforms, including Facebook, YouTube, and TikTok, have functioned as dominant channels for distributing health information while simultaneously becoming arenas for the proliferation of misinformation, potentially eroding public trust in health authorities. A systematic bibliometric analysis of 321 scientific publications from the 2020–2024 period identified significant research development

patterns, with a peak in productivity occurring in 2021 (73 publications), reflecting the academic response to the dynamics of the pandemic. This research trend indicates the sustainability of the topic even as the pandemic's intensity has waned, with the focus of study shifting toward long-term implications and structural challenges in digital health communication. The dominance of terms such as "social media," "COVID-19," and "public health" in the keyword analysis, coupled with the substantial contributions from leading institutions like the University of Florida and the University of Oxford, reinforces the central position of the United States in the global research landscape of this field. The emergence of countries like Qatar and Singapore as highly cited contributors further indicates an evolving and diversifying geographic footprint of impactful research. However, these findings must be contextualized with several methodological limitations. First, the exclusive use of the Scopus database potentially introduces a selection bias toward the literature it indexes. Second, reliance on the Biblioshiny software, while robust, may constrain the depth of certain analytical dimensions that could be explored with other tools. For future research, it is recommended to: 1) expand the data source by integrating other databases such as Web of Science and Dimensions to enhance external validity; 2) utilize network analysis tools like VOSviewer or CiteSpace to enrich perspectives through more comprehensive data visualization; and 3) extend the temporal scope to accommodate the most recent post-pandemic developments and emerging trends.

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