Research Article

Impact of Social Media on Information Dissemination and Public Perception during the COVID-19 Pandemic: A Scientometric Analysis

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ABSTRACT

The study makes a bibliometric evaluation of global publications on 'COVID-19 and Social Media" from 2020 to 2024. The published publications on this theme were searched, retrieved and downloaded from the Web of Science (WoS) citation database and analysed using bibliometric techniques based on selected bibliometrics analysis. The VOSViewer and Biblioshiny applications were used to construct indicators. The VOSviewer software and Biblioshiny applications were used to build and visualize bibliometric networks. This scientometric study examines the research output on COVID-19 and social media between 2020 and 2024, providing a comprehensive analysis of the trends collaborations and the impact of publications in this domain. A total of 1,351 documents sourced from 566 journals, books and other outlets were analysed, revealing an annual growth rate of 3.72% and an average document age of 2.03 years. Each publication garnered an average of 23.24 citations, highlighting this field's significant and scholarly impact during the pandemic. Also contributing authors, with 99 single-authored documents and a strong collaborative trend, averaging 4.55 co-authors per document. Notably, 31.24% of the work involved international collaborations, underscoring the global nature of research on the interaction of COVID-19 and social media. The analysis of document types showed that 78.5% were research articles (1,061) supplemented by 51 letters, 45 editorials and others, reflecting diverse approaches and scholarly contributions to the Keywords Plus (1,428 terms) and author-provided keywords (2,784 terms) enriched the thematic analysis. The USA leads with 475 papers and 9.718 citations, while China follows with 332 papers and 9.160 citations, The University of California system leads in volume with 35 papers (2.59% of total publications), achieving a moderate Citation-Per-Paper (CPP) of 16.09 and an h-index of 13 in contrast.

Keywords: COVID-19, Global publications, Information dissemination, Scientometrics, Social media.

INTRODUCTION

The outbreak of the COVID-19 pandemic has significantly disrupted global social, economic and healthcare systems, leading to an unprecedented reliance on information and communication technologies. Among these, social media emerged as a critical tool for disseminating information, fostering public awareness and influencing public perceptions, platforms, such as Twitter, Facebook, Instagram and YouTube become central to communication strategies during the pandemic, acting as spaces for health authorities governments, researchers and the public to share and access information in real-time, However, this surge in social media usage also raised concerns about misinformation, public health responses and individual behaviours. The dual role of social media as both an enabler of effective information dissemination and a propagator of misinformation has drawn considerable academic attention. Researchers across disciplines have explored how social media platforms facilitated the rapid spread of COVID-19-related information, shaped public discourse and influenced public compliance with health measures. At the same time, studies have highlighted the challenges posed by the "infodemic", an overabundance of information, including false or misleading content, which complicated efforts to deliver accurate health messages. Understanding the dynamics of social media during the pandemic is essential to addressing these challenges and optimizing its use for future public health crises. This study employs a scientometric approach to analyse research publications on the impact of social media on information dissemination and public perception during the COVID-19 pandemic. Scientometric analysis provides quantitative insights into the structure, trends and patterns of Scientometric literature offering a comprehensive

overview of research activities, collaborations and emerging themes. By examining publication trends, authorship patterns, citation metrics and keyword networks, this study seeks to map the intellectual landscape of this evolving field.

METHODOLOGY

The publications on "COVID-19 and Social Media" were first identified and then downloaded from the Clarivate Web of Science database (WoS). For this purpose, the authors developed a comprehensive search strategy (shown below) that used different keywords related to "COVID-19" and "Social Media". These are tagged to "Keywords" and "Title" (Article Title) confining the search to the period 2020 to 2024. The search yielded 1351 records, which were further analysed using additional features in the Web of Science database. The study used several quantitative and qualitative indicators on one hand and raw and relative indicators on the other hand. Among qualitative indicators, publication in a peer-reviewed journal is a good indicator of output. The publication count approach, where each actor received full credit or score irrespective of its occurrence in first or last position in the byline of address of authors in a paper. Among qualitative indicators, citations per paper, relative citation index and share in highly cited papers are used mainly. The VOSviwer and Biblioshiny applications were used for evaluating and visualizing the interactions among countries, Organisations, authors and keywords. The citations were counted from the date of publications till 12 November 2024. TITLE (COVID-19) and Key (social media*).

LITERATURE REVIEW

Social media has played a transformative role in the dissemination of information and shaping public perception during the COVID-19 pandemic. This review synthesizes key findings from recent studies (2019-2014) to highlight its impact, opportunities and challenges (Kappi, 2024). (Ahmed and Rasul, 2022) highlights the critical role of social media in managing COVID-19 misinformation and discusses how platforms like Twitter and Facebook were utilized for public health messaging during the pandemic (Abbas *et al.*, 2021) evaluated the dynamics of public perception management viz., social media, analysing how platforms amplified government and health authorities' crisis communication strategies during COVID-19. (Cinelli *et al.*, 2020) studied the infodemic generated by society during the pandemic. It examines how both accurate and misleading information spread rapidly, influencing public perception and behaviour. (Gao *et al.*, 2020) investigates the impact of prolonged social media exposure on mental health, particularly highlighting anxiety and fear caused by the dissemination of misinformation during the pandemic (Pulido *et al.*, 2020). This research explores dissemination patterns of credible vs. false information on social media, revealing user preferences for reliable sources, albeit with significant challenges in combating misinformation (Andika *et*

al., 2021). Analysing YouTube videos, the study discusses how health information dissemination affected public perception during the pandemic, identifying gaps in the quality of content shared online (Mackey *et al.*, 2020). This study aimed to detect and characterize user-generated conversations that could be associated with COVID-19-related symptoms, experiences with access to testing and mentions of disease recovery using an unsupervised machine-learning approach (Pulido *et al.*, 2020). This research explores dissemination patterns of credible vs, false information on social media, revealing user preference for reliable sources, albeit with significant challenges in combating misinformation (Tultul *et al.*, 2022). The study examines how excessive exposure to misinformation leaders to social media fatigue and public misinformation-sharing behaviours underscoring the necessity of effective content moderation (Zarocostas, 2020). This commentary delves into the strategies for combating the COVID-19 infodemic, emphasizing the importance of coordinated efforts among governments, social media platforms and public health organizations.

Through this analysis, the study aims to provide a comprehensive understanding of how scholarly efforts have documented the role of social media in the COVID-19 pandemic highlighting its strengths and challenges in shaping public perception and health communication. Insights from this research will inform future studies and strategies, ensuring more effective and ethical uses of social media in times of crisis (Gupta *et al.*, 2022) (Mehta, 2020).

OVERALL OVERVIEW

This study analyses COVID-19 and Social Media research from 2020 to 2024, covering 1.351 documents from 566 sources with a 3.72% annual growth rate. The publications are recent, with an average age of 2.03 years and each document receives on average 23.24 citations reflecting the relevance of the field. The dataset includes contributions and an average of 4.55 co-authors per document, indicating strong global and collaborative efforts. Most publications are research articles (1,061) supplemented by letters, editorial materials and reviews, with some retractions and corrections, showing an active and dynamic research environment.

Year-wise publication trend and citations count

Table 1 indicate the publication's trends on the role of social media during the COVID-19 pandemic, analysed from 2020 to 2024, revealing significant variations in research activity, impact and influence over the years. In 2020, with the onset of the pandemic, 3 notable research interests, marked by 176 publications (13.035 of the total publications), achieved a high citation count of 14.820, an impressive Citation-Per-Paper (CPP) of 84.2 and an h-index of 63, indicating substantial academic attention. Research peaked in 2021, with the highest number of publications at 405 (29.98%), through the total citations

(11.665) and CPP (28.8) decreased compared to 2020, reflecting a slight decline in citation impact per paper as the novelty of the pandemic wore off. The h-index of 54 in 2021 still demonstrates strong engagement, but slightly lower than 2020's figures. In 2022, research output remained nearly stable at 403 papers (29.83%), but total citations dropped significantly to 4,095, with a much lower CPP of 10.16 and an h-index of 26. This trend suggests that although research continued at a high rate, individual papers had less influence and received fewer citations, possibly as the field began to mature and as newer topics took precedence. In 2023, the publication count declined to 241 (17.84%), with a drastic drop in citations (737) and a CPP of 3.06. The h-index further declined to 12 highlighting a decrease in impactful research as pandemic-related studies potentially lost prominence in academic focus. Finally, by 2024, the number of publications fell to 126 (9.33%), with only 69 citations and minimal CPP of 0.55%, alongside an h-index of 4 indicating a steep reduction in both research output and influence. This downward trend reflects a tapering of scholarly interest in this area as the immediate effects of the pandemic become less relevant. Overall, the data indicates an initial surge in research impact and volume, which gradually declined over time as the global academic focus shifted away from COVID-19-specific topics.

Profile of Top 10 Most Productive Countries

Table 2 shows that the country's collaboration in COVID-19-related social media research shows the USA and China as the leading contributors, each with a high publication count and influence, reflected in significant citation impact and hi-indices. The USA leads with 475 papers and 9.718 citations, while China follows with 332 papers and 9.160 citations, England, Canada and Italy, though publishing fewer papers, achieve high Citation-Per-Paper (CPP) scores, indicating strong influence. Countries like Germany, Spain and South Korea contribute smaller outputs with moderate to lower impact. This global collaboration showcases high-volume and high-impact research efforts, emphasizing diverse contributions across regions.

Brod Subject-Wise Distribution

Table 3 shows that the subject-wise distribution of research on COVID-19- and Social media reveals that the highest volume of participation is in public and occupational Health (241 papers,

17,84%), with a moderate impact (CPP of 19.66) and h-index of 32, psychology and Health care sciences services follow, both achieving high CPPs of 29.22 and 28.11, respectively, indicating strong influence. Medical informatics and Science and technology stand out for their highest CPPs of 36.15 and 37.85, showing significant impact despite smaller output. Lower-volume fields like Computer Science and Communication have moderate influence, with lower CPPs of 15.82 and 10.21, respectively. This distribution underscores that while health-related areas lead in volume, fields like medical informatics and science and technology have the highest impact per paper.

Profile of Top 10 Most Productive Organisations

Table 4 shows that the productive organization on COVID-19 and social media research show varying levels of influence and impact. The University of California system leads in volume with 35 papers (2.59% of total publications), achieving a moderate Citation-Per-Paper (CPP) of 16.09 and an h-index of 13 in contrast, the University of London follows closely with 34 papers (2.52% 0 but stands out with a high CPP of 44.44 and a slightly higher h-index of 14 reflecting substantial influence per paper. The State University System of Florida ranks third, with 33 publications (2.44%0 and a CPP of 24.36% while Harvard University and Wuhan University, with 28 and 27 papers respectively, also show strong CPPs of 28.18 and 24.3, signifying their impactful contributions. Chinese have CPPs of 35.73 and 32.41, indicating high impact deposited lower output The Chinese University of Hong Kong is notable for the highest CPP (48.63), though it ranks lower in output with 19 papers, highlighting the significant influence of its research. The analysis indicates that while some institutions lead in volumes, others, like the University of London and the Chinese University of Hong Kong, excel in research impact per paper, contributing high-quality work to the field.

Profile of Top 10 Most Productive Authors

Figure 1 shows that the VOSViewer author publication map visualizes authors' collaboration and productivity in COVID-19 and social media research. Large nodes represent authors who have more publications or greater influence, while smaller models indicate fewer profiles of contributors, prominent authors like Afan Chen, Qiang Chen, Julia Brailovskaia and Edmund W.J. Lee have larger nodes, highlighting their significant contributions to

Table 1: Publications Trends with citations count.

Sl. No.	Year	TP	% TP	TC	CPP	*h*-index
1	2020	176	13.027	14,820	84.2	63
2	2021	405	29.978	11,665	28.8	54
3	2022	403	29.83	4,095	10.16	26
4	2023	241	17.839	737	3.06	12
5	2024	126	9.326	69	0.55	4

TP: Total publication, TC: Total Citations, CPP: Citation Per paper, *h*-index.

Table 2: Top 10 Most Productive Countries.

Sl. No.	Countries/Regions	TP	% TP	TC	CPP	*h* index
1	USA	457	33.827	9,718	21.26	47
2	Peoples R China	332	24.574	9,160	27.59	47
3	England	136	10.067	4,165	30.63	27
4	Canada	85	6.292	2,742	32.26	17
5	India	58	4.293	1,214	20.93	14
6	Italy	56	4.145	1,969	35.16	18
7	Germany	54	3.997	858	15.89	16
8	Australia	51	3.775	1,648	32.31	15
9	Spain	45	3.331	779	17.31	16
10	South Korea	37	2.739	308	8.32	10

Table 3: Subject-wise distribution of papers on COVID-19 and social media.

Sl. No.	Research Areas	TP	% TP	TC	CPP	*h* Index
1	Public Environmental Occupational Health	241	17.839	4,739	19.66	32
2	Psychology	183	13.546	5,348	29.22	33
3	Health Care Sciences Services	165	12.213	4,638	28.11	36
4	Medical Informatics	117	8.66	4,230	36.15	32
5	Computer Science	104	7.698	1,645	15.82	19
6	Communication	102	7.55	1,041	10.21	17
7	Environmental Sciences Ecology	99	7.328	1,962	19.82	21
8	Science Technology Other Topics	89	6.588	3,369	37.85	24
9	Psychiatry	86	6.366	2,399	27.9	20
10	Information Science Library Science	68	5.033	1,731	25.46	20

Table 4: Profile of the Top 10 Most Productive organizations on COVID-19 and social media.

Sl. No.	Organisations	TP	% TP	TC	CPP	*h* index
1	University of California.	35	2.591	563	16.09	13
2	University of London.	34	2.517	1,511	44.44	14
3	State University of Florida.	33	2.443	804	24.36	12
4	Harvard University.	28	2.073	789	28.18	11
5	Wuhan University.	27	1.999	656	24.3	11
6	Chinese Academy of Sciences.	22	1.628	786	35.73	8
7	Pennsylvania Commonwealth System of Higher Education PCSHE.	22	1.628	604	27.45	11
8	Shanghai Jiao Tong University.	22	1.628	713	32.41	8
9	University of Texas System.	21	1.554	525	25	10
10	Chinese University of Hong Kong.	19	1.406	924	48.63	9

the field. The colour gradient (from Blue to yellow) represents publication timelines with blue indicating earlier publications (2020) and yellow indicating recent ones (2023). Clusters of authors suggest collaboration networks, showing active participation and shared research interests in this domain.

Profile of Top 10 Most Productive Journals

Figure 2 VOSviewer map shows the network of journals publishing research on COVID-19 and social media. Each node represents a journal, with larger nodes indicating higher publication volume influence in this area. The proximity between nodes and the connecting lines indicates co-citation relationships and collaborative networks, suggesting journals that frequently
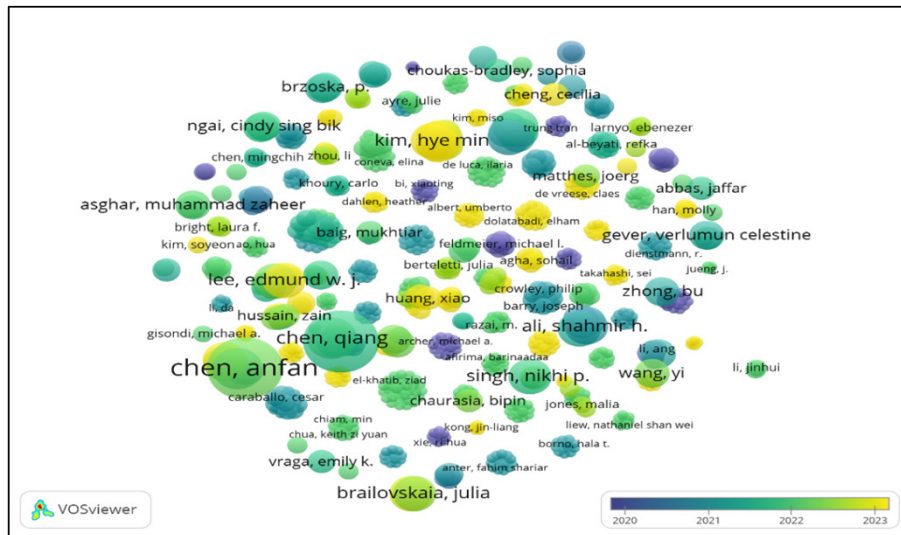
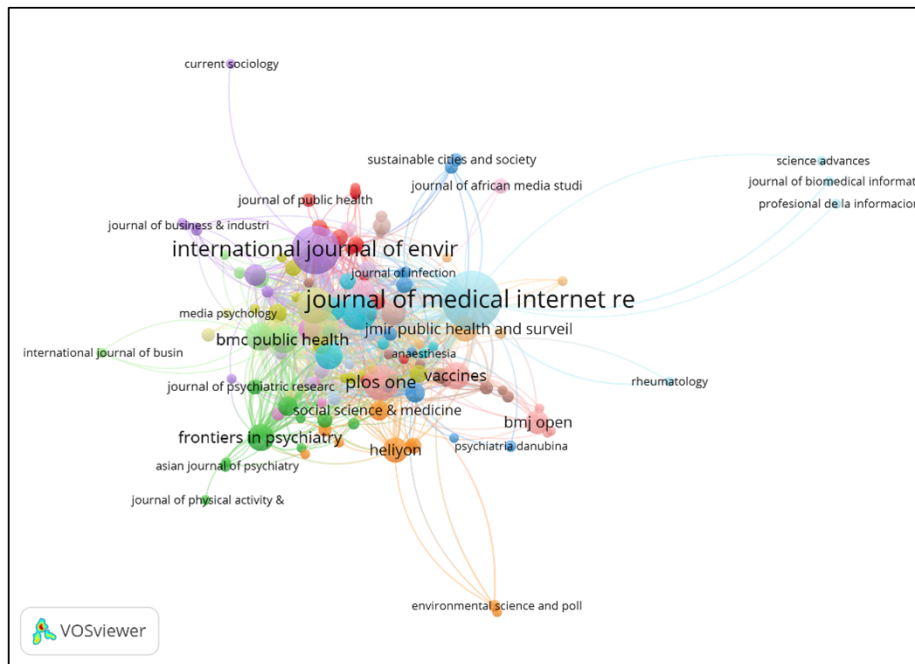**Figure 1:** Author collaboration Network Map.

Figure 2: Journals Collaboration Network.

reference each other's work or share thematic connections. The most prominent journals, such as the *Journal of Medical Internet Research, International Journal of Environmental Research and Public Health, BMC Public Health, POLS ONE, and Frontiers in Psychiatry,* have larger nodes, indicating their central role in disseminating research on this topic. These journals are closely clustered, which shows strong interconnections, likely due to the multidisciplinary nature of COVID-19 research that spans health, public health, psychology and social science.

Significant Keyword Analysis and Factorial Analysis

Figures 3 and 4, this VOSViewer keyword co-occurrence map illustrates the thematic landscape of research on COVID-19 and social media. Key terms are represented by nodes, where larger nodes indicate higher frequencies of keyword occurrence, while colours represent different thematic clusters. The network shows a clear focus on three primary areas; public health and misinformation, mental health and social impact and pandemic-related response

Public health and Misinformation: (Blue Cluster)

These areas are centred on keywords like "misinformation", "infodemiology", "vaccine hesitancy", "health information" and: trust". This cluster reflects research on how social media has been both a source of health information and a breeding ground of
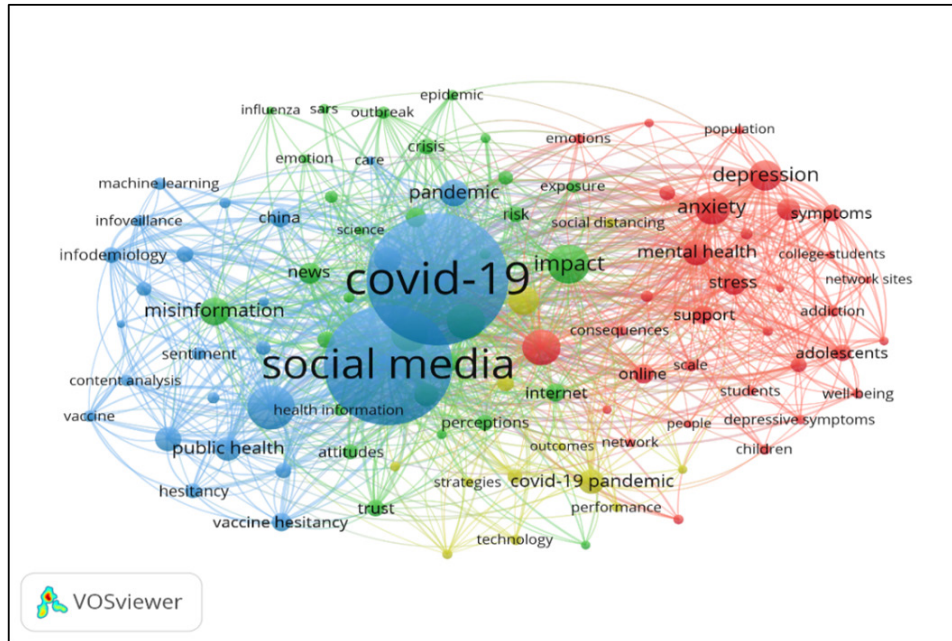
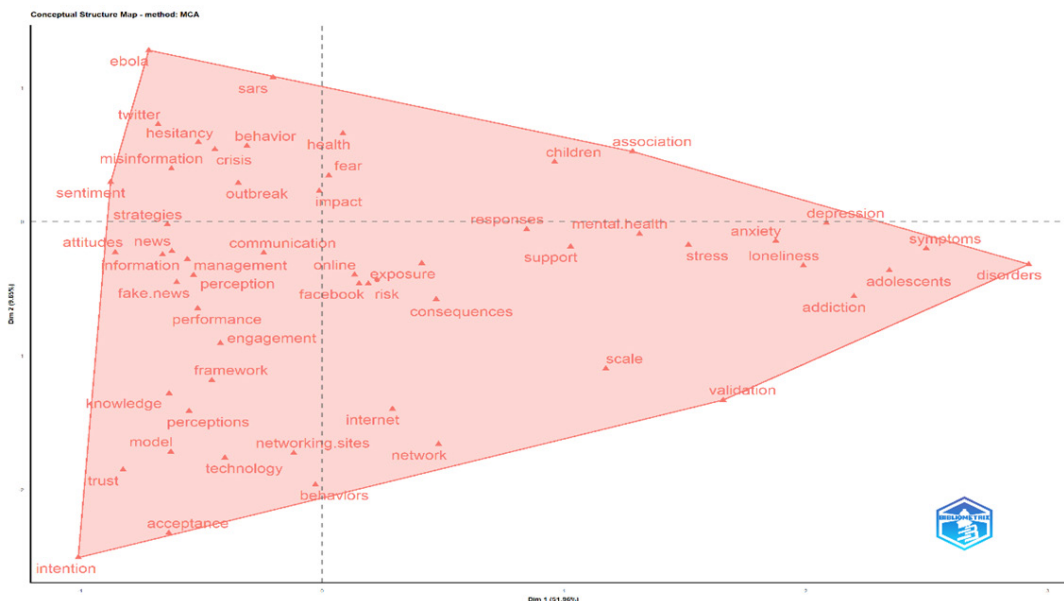**Figure 3:** Most significant keywords co-occurrence network.

Figure 4: Factorial analysis results.

misinformation during the pandemic influencing public trust and vaccine updates.

Mental Health and Social Impact: (red Cluster)

Key terms here include "mental health" anxiety" "depression", "stress", "support" and "adolescents", This cluster social media on anxiety, stress and depression. It highlights vulnerable groups like adolescents and college students and the role of social media in both exacerbating and potentially alleviating mental health challenges.

Pandemic Response and Social Media Dynamics: (Green Cluster)

Central keywords include "impact", "pandemic, "risk" "social distancing" and "strategies", This cluster examines how social media has affected pandemic responses, indicating public perceptions of risk, adherence to social distancing and broader societal impacts.

The results of the structure map visually represent the interrelations between social media's role, public perception and mental health impacts during crises like the COVID-19 pandemic, it highlights four main clusters:

Health and Mental Well-being: Focused on keywords such as anxiety, depression, stress and adolescents, emphasizing the pandemic's psychological impact, especially on vulnerable populations.

Misinformation and Communication: Featuring terms like misinformation, hesitancy and news, showcasing challenges in managing accurate information dissemination during health emergencies.

Behavioural and technological Interactions: Includes keywords like intention, trust, technology and Twitter, reflecting how social media shapes user behaviour and public trust.

Risk and Exposure: Central to the map, liking communication, risk and perceptions, underlying social media's mediating role is spreading health-related information and risks.

The map underscores social media's dual role in public health crises as both a valuable information source and a platform susceptible to misinformation. It also emphasizes the need for structured strategies to enhance trust and address mental health concerns.

CONCLUSION

This study provides a detailed scientometric analysis of the impact of social media on information dissemination and public perception during the COVID-19 pandemic. Social media platforms emerged as a critical tool for spreading health-related information, shaping public opinions and addressing pandemic-induced challenges such as misinformation, vaccine hesitancy and mental health concerns. The findings highlight the dual role of social media, it facilitates rapid communication and engagement but also contributes to the spread of misinformation and amplifies anxiety, stress and other mental health issues. The analysis identified key thematic areas such as public trust, communication strategies, misinformation management and the psychological impact of social media exposure during the pandemic. The conceptual structure map illustrated interconnections between public health information, behavioural changes, mental health and social media's role in mediating these dynamics. This study also underscored the importance of collaboration among international researchers and multidisciplinary approaches to tackle complex global crises effectively. This study provides valuable insights for policymakers, health professionals and social media companies to develop targeted strategies for improving information dissemination, building public trust and mitigating negative mental health outcomes. As the world continues to face public health crises, addressing these challenges through effective social media governance and public awareness campaigns will remain critical. Future research should further explore the long-term implications of social media on public health communication and its role in fostering resilience during emergencies.

CONFLICT OF INTEREST

The author declares that there is no conflict of interest.

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