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Digital Marketing, Influencer, Social Media, and Health: A Bibliometric and Thematic Analysis

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ABSTRACT

The rapid growth of digital marketing in the health sector has redefined how individuals access, interpret, and engage with health information. Social media and influencers play a significant role in disseminating health knowledge, shaping public perceptions, and even influencing health behaviors. However, this expansion has also brought challenges related to misinformation, the reliability of health communication, and the integration of digital strategies into evidence-based healthcare. This paper presents a bibliometric analysis using VOSviewer with data from Dimensions.ai (2020–2025), identifying four major thematic clusters: (1) health literacy and psychological factors, (2) effectiveness of digital health interventions, (3) evidence-based knowledge dissemination, and (4) policy, misinformation, and healthcare services. The discussion explores the interplay between these clusters and their implications for health communication, marketing strategies, and public policy. Findings highlight the dual potential of social media and influencers in both supporting evidence-based health promotion and propagating misinformation. Recommendations include enhancing collaboration between policymakers, researchers, and digital actors to foster a reliable and sustainable digital health ecosystem.

Keywords
Bibliometric Analysis
Digital Marketing
Health Communication
Influencer
Misinformation
Social Media

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Introduction

Digital platforms have transformed the landscape of health communication. With the widespread use of social media, digital marketing has become a vital strategy for health promotion, particularly when combined with influencer engagement. Influencers serve as mediators between scientific health knowledge and the public, capable of shaping behaviors and attitudes in ways that traditional communication channels often cannot [1].

Recent studies show that digital marketing in healthcare contributes to improved health literacy, increased access to information, and broader participation in health-related discussions [2], [3]. At the same time, the prevalence of misinformation and the absence of strong regulatory frameworks threaten the credibility and effectiveness of these strategies [4]. The COVID-19 pandemic, for example, highlighted the risks and opportunities of using influencers and social media as tools for disseminating health information [5].

Despite the abundance of publications, the thematic structures in this research area remain fragmented. Therefore, this study uses bibliometric mapping with VOSviewer to identify clusters and propose a framework for understanding the multidimensional relationship between digital marketing, influencers, social media, and health. The study aims to address the following questions:

- What are the dominant themes in the literature on digital marketing, influencers, social media, and health?
- How do these themes relate to health literacy, intervention effectiveness, evidence dissemination, and policy challenges?
- What future directions can enhance the integration of digital strategies into health systems?

Material and Methods

This study employed a bibliometric approach, also known as science mapping, to investigate the structure of knowledge networks within the field of digital marketing, influencer engagement, and health governance. Bibliometric mapping was selected because it enables the identification of dominant themes, the visualization of interrelationships among research topics, and the tracking of topic development over time.

To ensure the quality and relevance of the dataset, the study applied a set of eligibility criteria. The inclusion criteria were: (1) publications indexed in the Dimensions database, (2) journal articles as the only publication type, (3) availability of full-text manuscripts, (4) relevance to keywords such as digital marketing, influencer marketing, social media, and health, and (5) a publication range between 2020 and 2025. The exclusion criteria were: (1)

non-article formats such as abstracts, book chapters, and conference notes, (2) duplicate entries, and (3) incomplete bibliographic information.

Data collection was conducted through the Dimensions database, which was chosen for its comprehensive coverage of multidisciplinary research outputs. The search strategy combined the keywords digital marketing, influencer, social media, and health with temporal limits set between 2020 and 2025. The initial search retrieved 15,795 records. After applying the year filter (2020–2025), 12,696 records remained; narrowing further to health service yielded 3,004 records, and limiting to journal articles resulted in 2,353 publications. Finally, the dataset was sorted by Altmetric Attention Score to prioritize influential works. The bibliographic metadata including titles, abstracts, authors, keywords, publishers, and country affiliations were exported and organized using Microsoft Excel for preprocessing, cleaning, and management.

The bibliographic data underwent systematic filtering to remove incomplete entries and duplicates. Keywords, author collaborations, and institutional affiliations were examined to identify thematic structures. The cleaned dataset was then analyzed using VOSviewer, a widely adopted software tool for constructing and visualizing bibliometric networks. VOSviewer facilitated the creation of keyword co-occurrence maps, co-authorship networks, and citation linkages, allowing the detection of structural relationships between research topics, scholars, and countries. Furthermore, keyword trend analysis was performed to detect shifts in research focus across the five-year span. The outcomes of the analysis were presented in the form of bibliometric maps, graphs, and cluster diagrams, providing both structural and temporal insights into the field.

Results

A. Publication Analysis

Figure 1 illustrates the annual growth of publications between 2020 and 2025. The trend shows a steady increase from 199 publications in 2020 to 568 in 2025. While growth was moderate between 2021 and 2023, a significant surge occurred in 2024, reaching 530 publications, followed by continued growth in 2025. This upward trajectory reflects the expanding scholarly attention and research productivity in the field.

Figure 2 presents the trend of total citations from 2020 to 2025. Citations grew rapidly from 602 in 2020 to 7,095 in 2024, indicating increasing influence and recognition of publications in this field. However, a slight decline occurred in 2025, with citations decreasing to 6,590, suggesting a possible saturation or delayed citation effect despite continued publication growth.

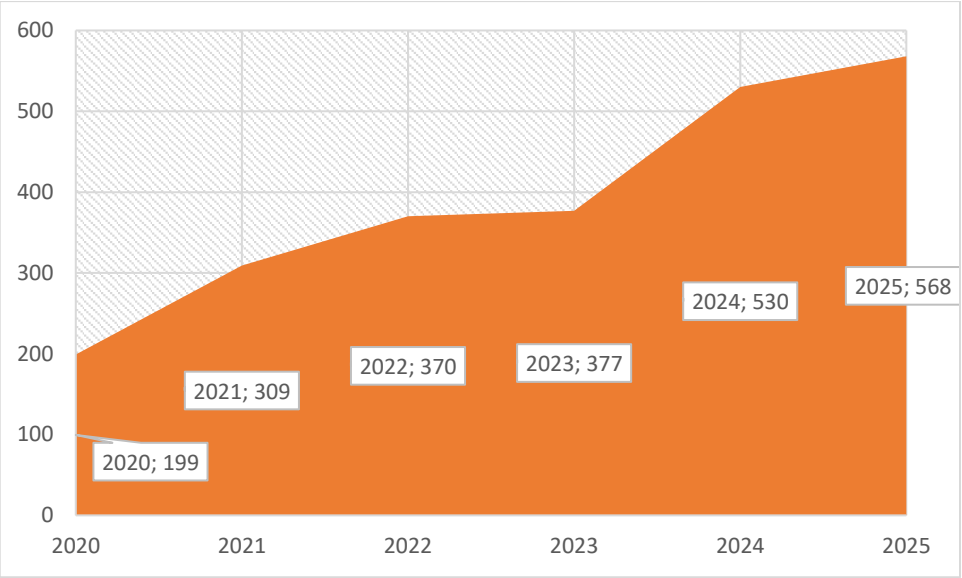


Fig. 1. Number of Publications (total)

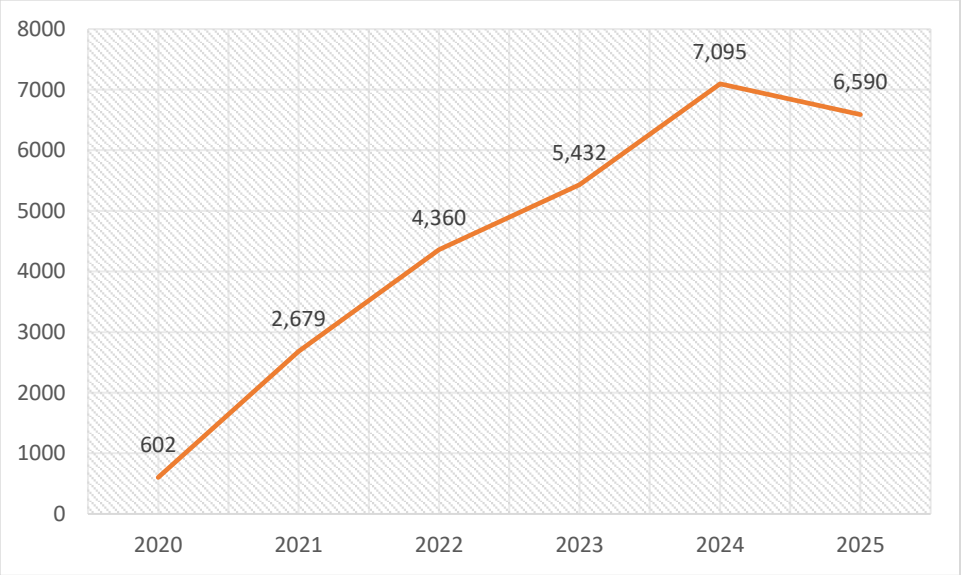


Fig. 2. Number of Citations (total)

Figure 3 shows the percentage of publications receiving at least one citation between 2020 and 2025. The proportion steadily decreased from 92.46% in 2020 to only 20.77% in 2025. This decline is likely explained by the time-dependent nature of citations: older publications have had more time to accumulate citations, while newer works (especially those published in 2024 and 2025) have not yet had sufficient exposure or citation cycles. In addition, the rapid increase in publication volume in recent years may have diluted attention across a larger number of articles, slowing citation accumulation for individual works.

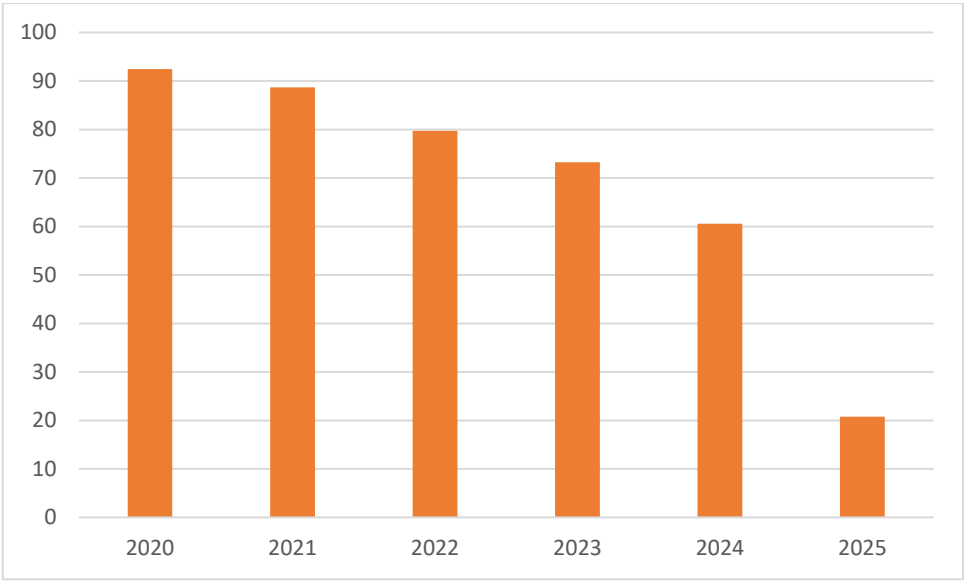


Fig. 3. Publications with citations (%, ≥1 citations)

B. Visualization Analysis

1. The overlay visualization

The overlay visualization illustrates the temporal evolution of research themes in the intersection of digital marketing, social media, influencers, and health between 2022 and 2023.

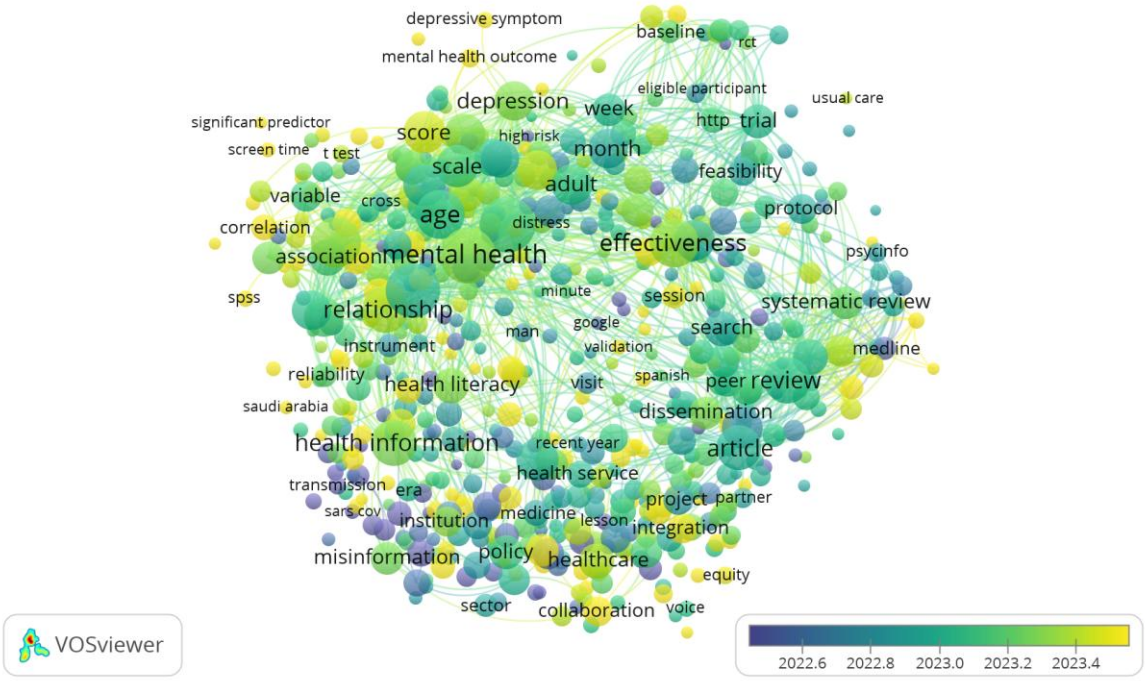


Fig. 4. The overlay visualization

The temporal mapping of research development highlights a clear shift in focus across different phases. Earlier studies (blue nodes, 2022–2022.8) placed strong emphasis on *misinformation, healthcare institutions,* and *policy-related discussions*. This indicates that the initial wave of research was primarily concerned with addressing systemic challenges in health communication and governance, particularly the risks associated with inaccurate information. Moving into the mid-phase (green nodes, 2022.8–2023.0), research interests expanded toward *health information, health literacy, relationships,* and *mental health*. This transition reflects a growing recognition of the ways digital platforms shape individual health behaviors, knowledge acquisition, and psychosocial outcomes. Finally, in the recent phase (yellow nodes, 2023.2–2023.4), the focus shifted further toward *systematic reviews, peer review, dissemination,* and *depression-related themes*. This progression illustrates a movement toward consolidating the field through evidence-based evaluations, validation of digital interventions, and the prioritization of mental health as a central area of application. Collectively, the chronological trend reveals an evolution from policy- and governance-oriented concerns to individual-focused studies, and ultimately toward rigorous, evidence-driven approaches that strengthen the credibility and impact of research in digital health communication.

2. The density visualization

The density visualization reveals several key insights into the structure of research within the field of digital marketing, social media, influencers, and health. The core concentration of studies lies in dense areas represented by keywords such as *mental health*, *health information*, *relationship*, *effectiveness*, and *systematic review*.

This suggests that much of the research is directed toward evaluating the effectiveness of health-related digital interventions and examining how digital information and online relationships shape mental health outcomes. Surrounding these are secondary but significant areas, including *health literacy*, *peer review*, *dissemination*, and *article*, which reflect active discussions on publication practices, evidence validation, and the credibility of knowledge transfer through digital platforms. At the periphery, themes such as misinformation, policy, collaboration, and healthcare institutions appear in lower-density regions, indicating that while these topics are relevant, they are less emphasized compared to individual-level studies. Their presence, however, underscores broader systemic and governance-related issues, particularly the challenges of misinformation in health communication. Taken together, the overall density pattern shows that the field is strongly centered on mental health and health information effectiveness, supported by systematic reviews and evidence-based research.

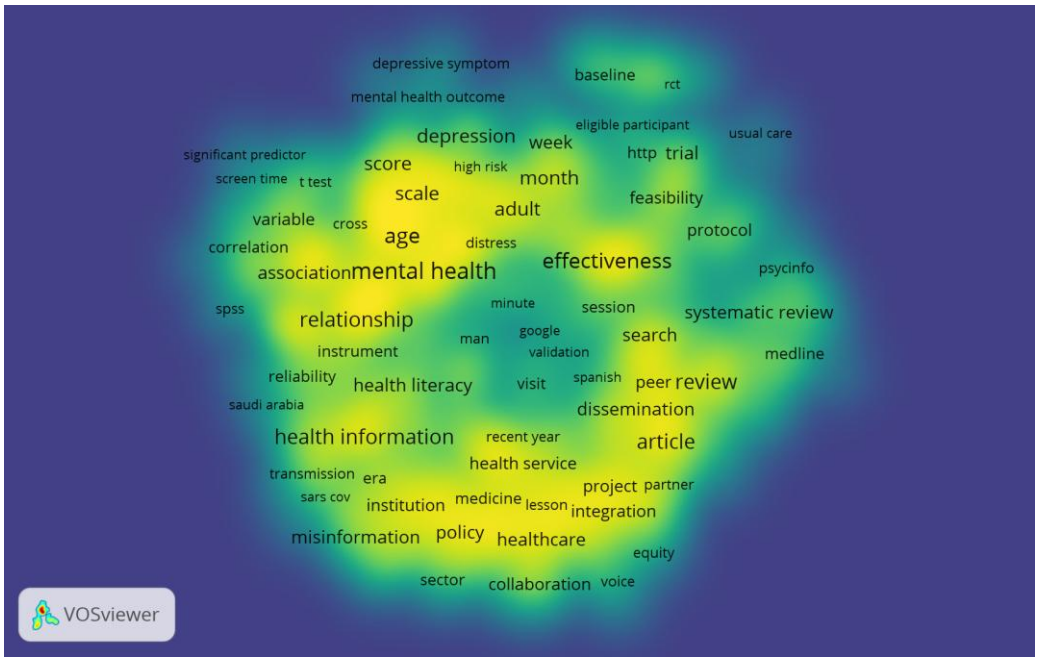


Fig. 5. The density visualization

Meanwhile, institutional and policy-related dimensions, though less dominant, remain important as emerging directions for future investigation.

3. The network visualization

The network visualization provides an overview of the thematic structure within digital health communication research, showing clusters of interconnected keywords that reflect the intellectual organization of the field. See Fig. 6.

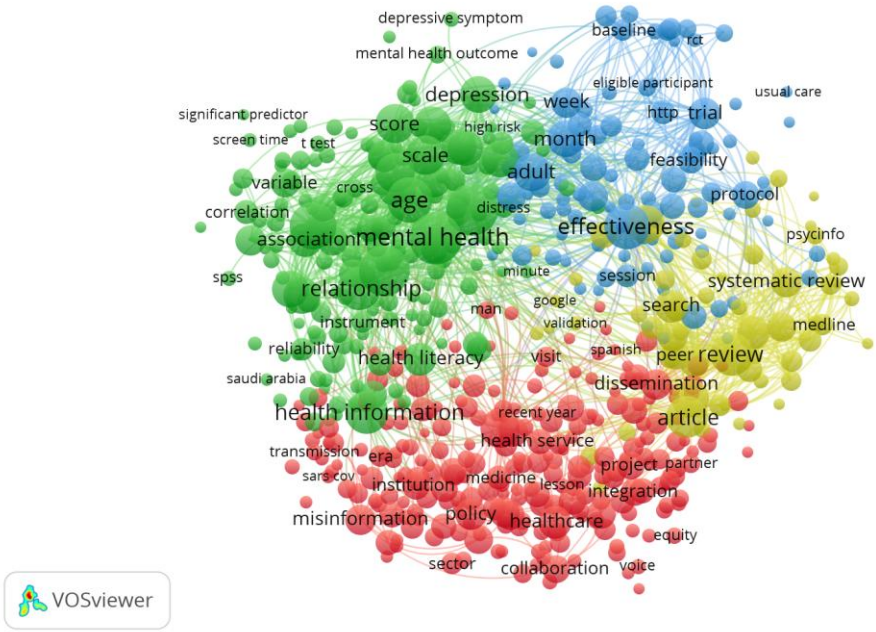


Fig. 6. The network visualization

- Central Cluster (Green – Mental Health and Health Information)
  The largest and densest cluster centers around *mental health, health information, health literacy*, and *relationship*. This indicates that the dominant focus of research lies in exploring how digital information and interpersonal connections affect mental health outcomes. Keywords such as *association, reliability, correlation,* and *scale* suggest that many studies adopt quantitative approaches to measure psychological impacts.
- Clinical and Intervention Cluster (Blue – Effectiveness and Trials)
  The blue cluster emphasizes *effectiveness, trial, depression, adult, week, month,* and *baseline*. This area reflects a concentration on clinical trials and intervention studies, highlighting the role of evidence-based assessments in determining the impact of digital health tools. The presence of terms like *protocol, feasibility,* and *session* further reinforces the methodological and experimental orientation of this cluster.
- Systematic Review and Dissemination Cluster (Yellow – Evidence Validation)
  The yellow cluster is dominated by *systematic review, peer review, dissemination,* and *article*. This reflects the research community's effort to validate findings, consolidate knowledge, and strengthen the credibility of digital health research through evidence synthesis and academic publishing practices. Keywords like *search, medline,* and *psyinfo* highlight the reliance on databases and systematic approaches.
- Policy and Institutional Cluster (Red – Governance and Misinformation)
  The red cluster highlights *misinformation, policy, healthcare, institution, collaboration,* and *equity*. Although less central than the green and blue clusters, this group addresses systemic and governance-related dimensions of digital health. The prominence of *misinformation* suggests persistent concerns about the credibility and risks of digital communication in health contexts.

The visualization shows strong interconnections between the green and blue clusters, suggesting that studies on *mental health* and *effectiveness* are closely interlinked. The yellow cluster connects to both of these, serving as a validating mechanism through systematic reviews. The red cluster, while somewhat peripheral, bridges to others through *health information* and *dissemination*, indicating that governance and misinformation are integral but not dominant themes. See Table 1 for the summary.

Table 1. The summary of themes

Cluster	Subtheme	Main Keywords	Focus Issue
Green	Health Literacy and Psychological Aspects of Audiences	health literacy, depression, age, relationships, communication	Health literacy, age factors, psychological conditions, and social relationships influencing how health messages are received on social media.
Blue	Effectiveness of Digital Health Interventions	intervention, trial, protocol, time, effectiveness	Evaluation of health campaigns based on digital marketing through trials, short- and long-term effectiveness.
Yellow	Dissemination of Evidence-Based Knowledge	systematic review, peer review, dissemination, article, evidence-based	The role of academic publications, systematic reviews, and their connection to influencer communication strategies.
Red	Policy, Misinformation, and Digital Health Services	misinformation, policy, digital health, service, public health	Challenges of misinformation, the role of public policy, and the integration of digital health services with regulations and multi-sector collaboration.

Discussion

A. Health Literacy and Psychological Factors

Health literacy emerges as a central determinant in shaping how individuals interpret, evaluate, and apply health information accessed through digital platforms, particularly social media. A growing body of evidence demonstrates that individuals with higher levels of health literacy possess stronger critical appraisal skills, enabling them to distinguish credible, evidence-based content from misinformation and disinformation circulating online [6]. In contrast, limited health literacy not only reduces the ability to filter out unreliable information but also heightens susceptibility to persuasive misinformation campaigns, thereby amplifying health risks and widening disparities in digital health outcomes [7].

Beyond literacy, psychological and demographic dimensions play a critical role in mediating responses to digital health communication. Factors such as *depression, anxiety, age, and stress* significantly influence how individuals process and engage with health-related messages. For example, younger audiences often exhibit higher receptivity to influencer-driven campaigns, where peer relatability and visual storytelling are perceived as trustworthy cues. Meanwhile, older adults demonstrate a stronger reliance on institutional credibility and prefer messages that emphasize scientific rigor and official endorsements [8]. This divergence highlights the necessity of tailoring digital strategies to demographic and psychological profiles in order to maximize impact and minimize unintended harms.

Social relationships and trust dynamics further complicate the effectiveness of digital health marketing. Trust in influencers has been shown to significantly shape message reception and behavioral outcomes [9]. In many cases, influencers function as mediators

between formal health institutions and lay audiences, bridging gaps in accessibility and comprehension. However, this mediation can be a double-edged sword: while trusted influencers can promote credible health practices, they may also inadvertently or deliberately propagate misleading information.

Taken together, this cluster underscores the importance of designing digital health marketing strategies that are responsive to varying literacy levels, demographic differences, and psychological contexts. Effective campaigns must combine persuasive techniques with transparent, evidence-based content that empowers audiences rather than manipulates them. For influencers, the ethical imperative lies in balancing engagement-driven approaches with responsibility to avoid misleading audiences and to foster informed health behaviors [10]. This highlights a broader challenge for the digital health ecosystem: ensuring that persuasive communication aligns with public health objectives while addressing vulnerabilities rooted in literacy gaps, psychological factors, and trust dynamics.

B. Effectiveness of Digital Health Interventions

The second cluster places strong emphasis on *effectiveness*, with keywords such as trial, protocol, adult, month, and depression emerging as central indicators. This cluster reflects the growing body of scholarship devoted to assessing not only whether digital health interventions attract attention, but more critically, whether they lead to tangible improvements in health outcomes. Research increasingly demonstrates that social media–based interventions can contribute to positive mental health outcomes, support sustainable lifestyle changes, and enhance adherence to prescribed treatment regimens [11], [12]. Such interventions extend beyond awareness-raising into the realm of behavioral modification, positioning social media platforms as legitimate tools within the broader public health intervention landscape.

Evidence from randomized controlled trials (RCTs) provides the most robust support for this cluster. RCTs have shown the feasibility of using social media and digital platforms to deliver behavioral interventions, including smoking cessation initiatives, weight management programs, and physical activity campaigns [13]. Importantly, these trials often highlight social media's capacity to reach large and diverse populations at relatively low cost, thereby lowering barriers to participation. The integration of trial-based methodologies into digital contexts also points toward a maturation of the field, where efficacy and effectiveness are increasingly scrutinized using rigorous scientific standards rather than anecdotal or short-term metrics.

Nevertheless, effectiveness is not universal; outcomes vary significantly depending on intervention design, duration, and delivery mode. Key mediating factors include the credibility of the messenger whether the source is an institutional actor, such as a healthcare organization, or an influencer with strong peer relatability [14]. Whereas institutional credibility often

appeals to older or more health-conscious demographics, influencer-driven messaging may resonate more with younger audiences who prioritize authenticity and engagement. Similarly, program duration plays a crucial role: shorter interventions may capture attention but fail to sustain behavioral change, while longer-term initiatives require consistent reinforcement and user engagement mechanisms to maintain effectiveness.

This body of evidence underscores the urgent need for rigorous, longitudinal evaluations of digital campaigns to ensure they generate measurable health improvements rather than simply optimizing for engagement metrics such as clicks, likes, or shares [15]. The emphasis on trials and protocols within this cluster reflects an emerging consensus that digital health interventions must be subjected to the same standards of evidence-based validation as traditional public health programs. Ultimately, the cluster highlights a pivotal shift in the literature: from viewing social media as a communication tool to positioning it as an intervention delivery platform whose effectiveness must be continually tested, validated, and refined.

C. Evidence-Based Knowledge Dissemination

The third cluster highlights the intersection of systematic review, peer review, dissemination, and article, underscoring a growing scholarly and practical effort to integrate principles of evidence-based medicine (EBM) into the domain of digital health communication. The prominence of these keywords illustrates the recognition that digital platforms are not merely sites for information sharing, but also arenas where the credibility and scientific validity of health content must be safeguarded. This shift marks an important evolution in the literature, from focusing solely on digital health interventions and literacy, toward ensuring that interventions and messages are supported by systematically validated evidence.

Despite the wealth of systematic reviews and peer-reviewed studies available, the dissemination of evidence through social media remains uneven and often inadequate. While academic publications provide robust findings, their technical language, methodological complexity, and limited accessibility often prevent lay audiences from engaging meaningfully with the knowledge they generate [16]. In contrast, influencers and digital content creators tend to rely on simplified narratives to reach wider audiences. While this strategy enhances reach and relatability, it also raises risks of oversimplification or distortion, where critical nuances of evidence are lost or misrepresented [17]. Such gaps can undermine public trust and perpetuate misperceptions about health practices or interventions, particularly in contexts where misinformation is already widespread.

Bridging this disconnect requires innovative communication strategies that merge academic rigor with engaging, accessible storytelling. Scholars and practitioners increasingly advocate for collaborative models where researchers, healthcare institutions, and digital

communicators work together to curate, translate, and disseminate scientific findings in ways that retain accuracy while appealing to diverse audiences [18]. For instance, graphical abstracts, short explainer videos, and interactive infographics represent emerging tools for bridging the divide between academic outputs and public understanding. Similarly, the integration of systematic review findings into influencer-driven campaigns or institutional social media channels could significantly enhance the reach and impact of evidence-based messages.

This cluster thus represents a pivotal frontier in digital health communication. By embedding systematic review evidence into peer-reviewed dissemination practices and translating them into user-centered narratives, the field moves closer to ensuring that digital health ecosystems are not only engaging but also scientifically credible. In this way, the cluster signals an ongoing transformation: from fragmented and anecdotal digital health content to a more structured and evidence-grounded model of knowledge transfer, where the authority of science and the accessibility of digital media converge.

D. Policy, Misinformation, and Healthcare Services

The fourth cluster centers on misinformation, policy, healthcare, and collaboration, reflecting the systemic and governance-oriented dimensions of digital health communication. The prominence of misinformation as a keyword underscores its significance as both a barrier and a catalyst for scholarly attention in this field. During global health crises, such as the COVID-19 pandemic, misinformation proliferated at unprecedented rates, with unverified claims circulating widely across social media platforms [19]. This phenomenon, often described as an “infodemic,” demonstrated how false or misleading content could undermine public trust, distort health behaviors, and compromise the effectiveness of official health campaigns.

In response, policymakers and regulators face the difficult challenge of balancing freedom of expression with the need to curb harmful health content. Overregulation risks restricting open dialogue and innovation, while underregulation enables the spread of dangerous falsehoods. Recent literature points to the emergence of collaborative models involving governments, technology platforms, and healthcare institutions as promising strategies to address this dilemma [20]. These partnerships aim to ensure that reliable, evidence-based content is amplified, while misinformation is flagged or de-prioritized in digital ecosystems.

At the same time, healthcare services themselves are increasingly adopting digital marketing approaches to improve reach and patient engagement. Hospitals, public health agencies, and international organizations are experimenting with social media campaigns to disseminate preventive measures, promote healthy lifestyles, and increase awareness of

treatment options. Yet, persistent concerns remain regarding equity and accessibility [21]. Digital health campaigns often favor populations with higher digital literacy and stronger internet access, leaving behind marginalized groups who may benefit most from accurate health information [22].

A particularly complex element within this cluster involves the role of influencers. On the one hand, influencers hold significant potential to amplify public health campaigns, bridging the gap between formal health institutions and everyday audiences. On the other hand, their autonomy and commercial incentives create risks of misalignment with official guidelines, which can inadvertently undermine institutional trust [23][24]. This dual role highlights the need for ethical frameworks that guide influencer participation in health communication.

Taken together, this cluster highlights the urgent need for comprehensive regulatory frameworks and ethical guidelines governing digital marketing in healthcare. Ensuring that strategies are equitable, transparent, and aligned with evidence-based principles is critical to protecting public trust [24][25]. Moreover, fostering sustained collaboration among policymakers, healthcare providers, platforms, and digital influencers emerges as a key pathway to ensure that digital health communication both mitigates misinformation and serves the broader goals of population health [26].

Conclusion

This bibliometric analysis identified four dominant themes in the literature on digital marketing, influencers, social media, and health. These include: (1) health literacy and the role of psychological and demographic factors in shaping engagement, (2) intervention effectiveness as demonstrated through trials and behavioral change studies, (3) evidence dissemination and the translation of systematic reviews into accessible formats, and (4) policy, misinformation, and the role of collaboration in ensuring ethical digital health communication.

Together, these themes highlight that digital platforms serve as both opportunities and challenges. On the one hand, they promote health literacy, provide channels for effective interventions, and enable the dissemination of peer-reviewed evidence. On the other hand, they expose populations to misinformation, raise questions about trust in influencers versus institutions, and require robust policy frameworks to regulate health communication responsibly.

Looking ahead, future directions for research and practice include: developing tailored strategies to enhance health literacy across diverse communities, moving beyond engagement metrics to evaluate long-term health outcomes of digital interventions, and building collaborative networks between researchers, health professionals, and influencers to ensure evidence-based dissemination. Additionally, the integration of digital strategies into health

systems must be guided by policies that balance innovation with ethical safeguards, ensuring equitable access to credible health information and interventions.

Conflict of Interest

The authors declare that there is no conflict of interest.

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