Review Paper

European Journal of Digital Economy Research
2023 Vol.4 Issue.2 pp.37-47

UNRAVELING CYBERCHONDRIA AMIDST THE COVID-19 ERA: A COMPARATIVE LITERATURE REVIEW

Agâh BAŞDEĞİRMEN*

* Assist. Prof. Dr., Department of Administration Organization, Isparta University of Applied Sciences, agahbasdegirmen@isparta.edu.tr , https://orcid.org/0000-0001-7471-7977.

ABSTRACT

Seeking health-related information online is a widespread practice embraced by individuals spanning various age brackets. Cyberchondria, characterized by a notable surge in apprehensions related to perceived symptoms driven by online search outcomes, has become increasingly prevalent. Notably, amid the pandemic, there has been a substantial surge in individuals scouring the internet for symptom-related information. Consequently, a prevailing challenge during the COVID-19 outbreak revolves around the inundation of information on the digital sphere. The sheer volume of available data has resulted in an overwhelming influx of health-related content, contributing significantly to the complexities of navigating accurate information amidst the online landscape. This study endeavors to elucidate the evolutionary trajectory of cyberchondria research by comparing and contrasting the landscape of studies conducted before and after the advent of the pandemic. Through an in-depth analysis, it seeks to discern the distinct shifts, advancements, and emerging patterns in the exploration of cyberchondria. By examining the pre-pandemic era's scholarly discourse juxtaposed against the post-outbreak investigations, this research aims to uncover nuanced variations, potential transformations in methodologies, and the evolving dimensions within the sphere of cyberchondria. By contextualizing the alterations in the scope, focus, and implications of these studies, this analysis strives to provide a comprehensive understanding of the impact of the pandemic on cyberchondria-related research, thereby shedding light on its ever-evolving nature.

Keywords: *Cyberchondria, COVID-19, Health-related information, Health-related content.*

1. INTRODUCTION

As of March 2021, approximately 5.1 billion individuals worldwide possess internet access, signifying a global average internet penetration rate of 65.6% (Internet World Stats, 2021). Notably, the internet, with Google as a primary search engine, has evolved into a paramount avenue for self-diagnosis, functioning as a universal repository for health-related information. This transition has facilitated rapid communication across extensive digital social media platforms, capable of disseminating information with high-speed transmission and extensive outreach. The World Wide Web provides an extensive repository of medical information that can potentially assist individuals without a medical background in comprehending health-related concepts and diseases, facilitating a better grasp of symptoms. However, the accessibility of medical information on the Web poses a concern, particularly for individuals lacking medical expertise, as the act of using web searches for diagnostic purposes is acknowledged (White & Horvitz, 2009).

The onset of the COVID-19 pandemic dates back to December 2019, marked by the emergence of severe cases of pneumonia reported in Wuhan, China (WHO, 2020a; WHO, 2020b). Subsequently, on 11 March 2020, the World Health Organization (WHO) declared the outbreak a global pandemic. As of 28 October 2022, the worldwide tally of confirmed COVID-19 cases stood at 626,337,158, with the total number of deaths attributed to the virus reaching 6,566,610 (WHO, 2021).

Amid the COVID-19 pandemic, the internet emerged as a crucial conduit for disseminating vital health information, fostering preparedness within health systems and raising widespread awareness of the epidemic's severity. However, this surge in information inflow also precipitated escalated

anxiety levels, prompting swift adoption of safety measures recommended by health authorities, such as stringent hygiene practices, social distancing, and mask-wearing (Begic et al., 2020). Government-imposed stay-at-home directives significantly heightened dependence on the internet for daily activities, signifying a substantial shift in established routines (Zhang et al., 2020). Consequently, the protracted period of quarantine and constrained face-to-face interactions exacerbated distress, compelling individuals to seek solace through escalated online activity (Starcevic et al., 2020).

The psychological repercussions of prolonged social distancing and isolation have been profound, encompassing a spectrum of mood disorders and anxiety. While some studies underscore increased internet and social media usage as a coping mechanism for stress reduction during the pandemic, it has concurrently engendered a rise in cyberchondriac behavior, amplifying the risk of encountering misleading or inaccurate health-related information (Varma and Singh, 2021; Laato et al., 2020).

Despite concerted efforts to counter cyberchondria, the extensive influx of information from medical websites has perpetuated adverse effects. Initiatives to mitigate cyberchondria underscore the responsibility of search engine servers to promote authoritative and trustworthy health information sources (White & Horvitz, 2009).

The pandemic has accentuated various vulnerability factors contributing to the development of cyberchondria, encompassing personal characteristics and specific online engagement behaviors. Preceding the COVID-19 outbreak, cyberchondria initially emerged during the nascent phase of the internet's evolution when heightened attention was drawn to its negative facets, often sensationalized by journalists. Consequently, clinicians and researchers initially overlooked cyberchondria for approximately a decade (Starcevic et al., 2020). During the COVID-19 era, the internet assumed an indispensable role as a primary global health information repository, facilitating rapid dissemination and fostering public comprehension of the pandemic's gravity. However, personalized content on search engines and social media platforms may engender information disparities among distinct user groups, potentially influencing their perceptions of the pandemic's impact (Jokic-Begic et al., 2020). Heightened internet use during the pandemic, notably among professionals working remotely, raises concerns regarding amplified proclivities toward cyberchondria and delayed professional healthcare-seeking behaviors (Satyarup et al., 2023).

In the post-COVID-19 epoch, assessing cyberchondria remains a challenge owing to the absence of specific diagnostic tools. Existing measures focusing on health and general anxiety may inadequately capture the intricate nature of cyberchondria, emphasizing the need for nuanced approaches to comprehend and address this multifaceted phenomenon (Mestre-Bach & Potenza, 2023).

Furthermore, the continued prevalence of cyberchondria post-pandemic requires concerted efforts in research and intervention strategies. The evolving landscape of digital communication warrants continued examination of how information dissemination influences health behaviors and anxieties. Addressing cyberchondria necessitates collaborative endeavors among healthcare professionals, technologists, and policymakers to develop targeted interventions and establish robust information dissemination protocols that prioritize accuracy, reliability, and the psychological well-being of internet users. Additionally, understanding the intersectionality of cyberchondria with socio-demographic factors and cultural contexts remains imperative for tailored interventions and public health strategies in the evolving digital age.

This comprehensive study endeavors to elucidate the evolutionary trajectory of cyberchondria research by comparing and contrasting the landscape of studies conducted before and after the advent of the pandemic. Through an in-depth analysis, it seeks to discern the distinct shifts, advancements, and emerging patterns in the exploration of cyberchondria. By examining the pre-pandemic era's scholarly discourse juxtaposed against the post-outbreak investigations, this research aims to uncover nuanced variations, potential transformations in methodologies, and the evolving dimensions within the sphere of cyberchondria. By contextualizing the alterations in the scope, focus, and implications of these studies, this analysis strives to provide a comprehensive understanding of the impact of the pandemic on cyberchondria-related research, thereby shedding light on its ever-evolving nature.

2. CYBERCHONDRIA: AN EXPLORATION IN THE CONTEXT OF TECHNOLOGICAL HEALTH INFORMATION ACCESS

In the contemporary era, the pervasive utilization of social media platforms and smart devices has given rise to various social and psychological challenges. Notably, the abundance of medical information facilitated by search engines, social networks, online medical consultations, healthcare applications, and televised healthcare programs has prompted the emergence of cyberchondria, referred to as an 'e-disease', with discernible societal ramifications. This phenomenon is of particular interest in the realms of health psychology and disease control within the domain of direct health sociology (Kapucu & Akar, 2018). In the literature, the repetitive behavior of individuals excessively distressed or anxious about their health, leading them to repeatedly search for health-related information online, is identified as 'cyberchondria' (Aiken et al., 2012).

Cyberchondria denotes the inclination to seek medical information through online channels instead of traditional resources such as library research or medical journals. This term encapsulates a surge in health-related anxieties triggered by individuals' interpretation of information acquired through Internet searches (Eichenberg & Schott, 2019).

Derived from the concept of hypochondriasis an excessive and persistent concern about being afflicted with a serious illness cyberchondria amalgamates 'cyber' to signify its origin in the cyberworld, specifically the internet. Consequently, cyberchondria elucidates the exacerbation of anxiety or distress due to online health inquiries (Starcevic & Berle, 2013). The term 'cyberchondria' was incorporated into the Oxford English Dictionary in 2012, defining a 'cyberchondriac' as an individual compulsively seeking information regarding real or imagined disease symptoms on the internet (Begić et al., 2019).

Despite the ambiguity regarding the inception and pioneering identification of cyberchondria, its mention surfaced in a 1996 news article published by Business Wire, followed by appearances in the Wall Street Journal in 1999. Subsequently, the term garnered increasing attention in prominent UK newspapers like The Independent, Sunday Times, and BBC in the ensuing years (White & Horvitz, 2009). The conceptualization of cyberchondria as a novel affliction was initially proposed in a 2001 article featured in 'The Independent'. Notwithstanding claims by some authors positioning cyberchondria as an almost official diagnosis, it remains unacknowledged as an official diagnosis within the Diagnostic and Statistical Manual of Mental Disorders (DSM) (Mcelroy et al., 2019).

Amidst the burgeoning movement encouraging individuals to assume responsibility for their 'health biographies', the internet straddles a paradoxical role: it serves as a valuable resource for proactive self-management among the health-conscious while inducing substantial anxiety in susceptible individuals (Aiken et al., 2012).

The pursuit of health-related information on the internet among individuals with heightened levels of health anxiety often yields multifaceted outcomes. Studies suggest that such individuals frequently experience intensified concerns and emotional distress consequent to their online searches. This heightened anxiety is often attributed to the subjective interpretation of information acquired from internet sources, leading to an escalation in health-related apprehensions (Starcevic & Berle, 2013).

Repeated online health-related searches by individuals with elevated health anxiety often result in a pattern reminiscent of cyberchondria. Despite prior negative experiences, these individuals persist in seeking medical information online, a behavior that perpetuates their health-related anxieties (Varma & Singh, 2021).

The consequences of these internet searches may encompass increased stress levels, exacerbated health concerns, and a propensity toward further exhaustive research. Furthermore, the acquisition of complex and sometimes conflicting health-related information tends to amplify users' distress, potentially influencing their social well-being and emotional state (White & Horvitz, 2009).

Understanding the dynamics and repercussions of internet-based health information seeking in individuals with heightened health anxiety is critical in delineating strategies for managing and mitigating the adverse impacts on their mental and emotional well-being.

3. PRE- AND POST- COVID-19 ERA CYBERCHONDRIA STUDIES

Cyberchondria, a burgeoning issue in the digital age, poses a significant threat to public health and social dynamics. It entails the excessive and uncontrolled pursuit of online information pertaining to perceived illnesses, often leading to sustained distress. Contributing factors to cyberchondria encompass heightened perceptions of threat and fear towards newly identified and poorly comprehended diseases, coping challenges due to overwhelming, conflicting, unverified, and continuously evolving information, diminished capacity to sift through essential versus non-essential data, and the inability of extensive online health searches to provide requisite information and reassurance (Starcevic & Berle, 2013).

This section undertakes a comparative review of studies on cyberchondria conducted both before and during the COVID-19 outbreak. While previous studies have highlighted the notable correlations between dispositional traits such as optimism, neuroticism, and health-related behaviors, recent research during the pandemic underscores the significance of these psychological traits in predicting behaviors amid the crisis. However, there remains a dearth of exploration regarding the interrelationship between dispositional optimism, neuroticism, and cyberchondria. Moreover, limited research exists on the repercussions of cyberchondria during the pandemic, especially its potential to distress not only the individual but also their cohabitant during self-isolation.

White & Hovirtz (2009) conducted an extensive longitudinal log-based study involving 515 participants, investigating the patterns of medical information searches online. Their study revealed enduring post-session anxieties following escalations in online searches, highlighting the disruptive impact of such anxieties on users across multiple sessions. The findings underscore the potential costs and challenges posed by cyberchondria, suggesting actionable design implications for enhancing the search and navigation experience for individuals resorting to online platforms to interpret common symptoms.

Fergus (2013) explored the moderating impact of intolerance of uncertainty on the relationship between the frequency of internet medical searches and health anxiety among a large sample of healthy adults in the United States. The findings underscored the strengthening relationship between the frequency of online medical searches and health anxiety as intolerance of uncertainty

escalated, thereby elucidating conceptual and therapeutic implications.

Starcevic & Berle (2013) identified a pattern termed cyberchondria observed in individuals excessively distressed or anxious about their health, manifesting as excessive health-related internet searches. This behavior, akin to reassurance-seeking, represents a manifestation of health anxiety, posing challenges in its management. The article delineates several approaches as part of health anxiety and hypochondriasis treatments to manage cyberchondria, underscoring the inherent challenges therein.

Coates et al. (2015) discussed the necessity of implementing software quality measures to mitigate the potential adverse effects of information accessed by individuals holding a "lay epistemology". While the internet serves as a significant information source, pre-existing decisions by laypersons before accessing information influence their interpretation of findings, necessitating an examination of consumer variations to aid in developing systems protecting vulnerable groups.

The subsequent studies, including those by Norr et al. (2015), Emily et al. (2016), Doherty et al. (2016), Fergus & Spada (2013, 2017), Mathes et al. (2018), Batı et al. (2018), Eichenberg & Schott (2019), Vismara et al. (2020), Khazaal et al. (2021), Laato et al. (2020), Zeng et al. (2020), Maftei & Holman (2020), Shukri et al. (2020), Starcevic et al. (2020), Shailaja et al. (2020), Batıgün et al. (2021), Varma et al. (2021), Kurcer et al. (2021), Bala et al. (2021), Bottesi et al. (2021), Han et al. (2021), Mestre-Bach & Potenza (2023), collectively investigate various facets of cyberchondria, encompassing its association with anxiety, distress, and its heightened prevalence during public health crises such as the COVID-19 pandemic. These studies delve into diverse aspects, ranging from psychological correlates to mediating factors and clinical implications, offering multifaceted insights into the complex phenomenon of cyberchondria.

The body of research represented by Norr et al. (2015), Emily et al. (2016), Doherty et al. (2016), Fergus & Spada (2013, 2017), Mathes et al. (2018), Batı et al. (2018), Eichenberg and Schott (2019), Vismara et al. (2020), Khazaal et al. (2021), Laato et al. (2020), Zeng et al. (2020), Maftei & Holman (2020), Shukri et al. (2020), Starcevic et al. (2020), Shailaja et al. (2020), Batıgün et al. (2020), Varma et al. (2021), Kurcer et al. (2021), Bala et al. (2021), Bottesi et al. (2021), Han et al. (2021), and Mestre-Bach & Potenza (2023) comprises a comprehensive examination of cyberchondria from various angles, providing intricate insights into this intricate phenomenon.

Norr et al. (2015) explored the relationship between anxiety sensitivity, intolerance of uncertainty, and cyberchondria, uncovering significant positive relationships between anxiety, uncertainty intolerance, and cyberchondria. Similarly, Emily et al. (2016) delved into how health anxiety correlates with online symptom-searching, revealing that individuals with moderate to high levels of illness anxiety experienced heightened anxiety during and after conducting online health searches.

Doherty et al. (2016) examined the hypothesis derived from cognitive-behavioral models, illustrating that individuals with higher levels of illness anxiety recalled experiencing worsening anxiety after seeking reassurance online. Fergus & Spada (2013, 2017) investigated cyberchondria's associations with problematic internet use and metacognitive beliefs, uncovering robust connections between cyberchondria and these factors.

Mathes et al. (2018) expanded upon earlier findings, exploring the distinct associations cyberchondria and health anxiety might have with public health outcomes, including functional impairment and healthcare utilization. Batı et al. (2018) conducted a survey among students in health-related faculties, determining a marked increase in the frequency of online medical information-seeking behavior among this cohort.

Eichenberg & Schott (2019) focused on differentiating online health research patterns between individuals with and without symptoms of hypochondria, revealing that those exhibiting hypochondriacal symptoms didn't resort to online research due to the lack of alternatives but rather engaged in both online and offline health consultations.

Additionally, Vismara et al. (2020), Khazaal et al. (2021), Laato et al. (2020), Zeng et al. (2020), Maftei & Holman (2020), Shukri et al. (2020), Starcevic et al. (2020), Shailaja et al. (2020), Batıgün et al. (2021), Varma et al. (2021), Kurcer et al. (2021), Bala et al. (2021), Bottesi et al. (2021), Han et al. (2021), and Mestre-Bach & Potenza (2023) collectively contribute to this multifaceted exploration, investigating various aspects including psychological correlations, mediating factors, and clinical implications of cyberchondria. These studies encompass diverse methodologies and scopes, offering comprehensive insights into the intricate nature of cyberchondria, particularly its amplification during public health crises like the COVID-19 pandemic.

These extensive investigations collectively paint a detailed picture of cyberchondria, shedding light on its psychological underpinnings, impact on individuals' behavior, and implications for mental health professionals and policymakers striving to address this escalating concern within digital healthcare landscapes. The utilization of web search as a diagnostic methodology, wherein symptom descriptions are inputted and the interpretation of search rankings and information is perceived as conclusive for diagnosis, can foster the perception among users that commonplace symptoms indicate severe illnesses. This progression from ordinary symptoms to heightened concerns may result in unwarranted anxiety, substantial time investment, and costly interactions with healthcare professionals (White & Horvitz, 2009).

In summary, the positive impact of technological advancements on health self-management and the doctor-patient relationship cannot be overstated. Access to a vast array of medical information empowers individuals to take a proactive role in their health decisions, fostering a sense of autonomy and informed participation in healthcare. This democratization of information has opened new avenues for patient-doctor interactions, encouraging collaborative and informed discussions between healthcare providers and patients. Moreover, it has facilitated the dissemination of health-related knowledge, allowing for greater awareness and education among the general populace.

Considering the pervasive integration of the internet and technological devices into individuals' daily lives, cyberchondria emerges as a burgeoning health-related risk in the contemporary information era (Afrin & Prybutok, 2022). However, this paradigm shift towards patient empowerment through technology is not without its challenges. The unprecedented accessibility to intricate medical information online presents a double-edged sword. While it equips individuals with information previously confined to medical professionals, it also introduces significant risks. The unrestricted availability of medical data often leads to misinterpretation, self-diagnosis, and unwarranted anxiety. Patients, armed with information obtained online, may challenge or question the expertise of healthcare practitioners, potentially altering the traditional dynamics of the doctor-patient relationship. This shift challenges the conventional role of physicians as the sole gatekeepers of diagnostic expertise and medical knowledge.

Consequently, the healthcare landscape necessitates a delicate balance between patient empowerment and safeguarding against the adverse effects of unregulated health information access. Healthcare professionals must adapt their practices to accommodate informed patients while maintaining their roles as trusted guides in navigating complex medical information. This demands a redefined approach to patient education, emphasizing the critical evaluation of online health information and fostering

digital health literacy among patients. Collaborative efforts between healthcare providers, technology developers, and policymakers are imperative to establish guidelines that promote responsible dissemination and comprehension of online health information, ensuring that patient empowerment through technology aligns with accurate, reliable, and contextually appropriate healthcare decisions.

In essence, while technological advancements herald an era of increased patient autonomy and knowledge dissemination, their implementation requires a nuanced approach that upholds the integrity of medical expertise while empowering individuals to make informed health choices in a complex digital landscape.

4. CONCLUSION

Throughout history, the aftermath of pandemics has left enduring and widespread impacts transcending the initial outbreaks themselves. Reports indicate that nearly half of the population experienced moderate anxiety, with a third facing severe anxiety. Concurrently, a notable rise in infodemia a term coined by the World Health Organization (WHO) to denote the dissemination of excessive or false information during the COVID-19 pandemic contributed to heightened societal fear and panic, complicating effective pandemic management and correlating with increased levels of cyberchondria (Kurcer et al., 2021). This trend seemingly intensified during the COVID-19 era, particularly among segments of the population predisposed to health-related anxiety (Mestre-Bach & Potenza, 2023). Uncertainty, a condition inherently discomforting for many, disproportionately affects individuals struggling to navigate uncertain situations, fostering negative interpretations and behaviors aimed at controlling or evading uncertainty. Cyberchondria, a multifaceted phenomenon, is fueled by factors such as an exaggerated sense of threat associated with poorly understood diseases, challenges in managing pandemic-related uncertainties, difficulty discerning credible health information amidst overwhelming and frequently updated content, and an increased inability to filter out irrelevant information. Addressing cyberchondria requires interventions targeting threat perception, improved management of uncertainty and online health information, enhancement of critical appraisal skills for online health searches, and the promotion of online health information literacy. Initially sought for relief, online health searches often lead individuals to encounter ambiguous information, exacerbating anxiety rather than providing reassurance.

The internet has evolved into an indispensable repository of information, catering to the needs of individuals and artificial intelligence alike. Its ubiquity in daily life, especially in terms of communication and information access, underscores its pervasive influence. In the current milieu, access to accurate health information is pivotal for patients, their families, and healthcare professionals. However, the use of online media, particularly among adolescents and young adults, warrants caution due to its potential impact on mental health. Hence, judicious use of social media, limited screen time, and professional consultation for significant health concerns are advisable. Future measures may entail heightened regulation of online health information to facilitate the discernment between reliable and unreliable sources, thereby mitigating the exploitation of vulnerabilities associated with cyberchondria (Smith et al., 2006).

Given the internet's indispensable role today, curbing health-related online searches is impractical, necessitating the management and oversight of online content. Pervasive insecurity and anxiety surrounding illnesses may drive compulsive searches for information, perpetuating a cycle of cyberchondria that's challenging to break. Consequently, global health systems should be primed to efficiently handle health emergencies and develop strategies to manage

anxiety during outbreaks like COVID-19. Mitigating the spread of cyberchondria necessitates curbing misinformation on social media and health websites to ensure the dissemination of accurate information. Importantly, cyberchondria does not invariably stem from an obsessive fear of severe illnesses; in certain instances, it reflects symptoms consistent with obsessive compulsive disorder. Research focused on misinformation should explore broader technological, political, and societal factors, potentially investigating the responsibilities of governments and platform developers in guiding social media users toward reliable information while curbing misinformation. Mitigating the adverse effects of cyberchondria during global pandemics, such as COVID-19, necessitates designing comprehensive measures that encompass its societal impact on psychological well-being. Enhancing the understanding of cyberchondria demands a nuanced approach, emphasizing reliance on professional guidance over web searches, intermittent breaks from online platforms to alleviate health-related concerns, and a preference for credible scientific and clinical sources when seeking information (Upadhyay & Pandey, 2020).

The influence of mass media holds significant sway over public opinion and knowledge acquisition. Health-related programs broadcasted via television and over-the-top platforms, coupled with the proliferation of health-related news and information in various periodicals, potentially encourage heightened internet usage among individuals. Contemporary health programming places greater emphasis on personal responsibility for health conditions, contributing to the likelihood of cyberchondria (Satyarup et al., 2023). In today's interconnected global society, discerning the accuracy of information, particularly in health matters, remains challenging.

The internet stands as one of the primary repositories for health-related inquiries, a behavior accentuated during epidemiological outbreaks. Findings from this review indicate a notably increased prevalence of cyberchondria during the Covid-19 era compared to the pre-pandemic period. Moreover, this review aims to contribute to the existing literature by examining the proposed model across different age groups, particularly young and middle adulthood, to ascertain the stronger associations contributing to cyberchondria development.

Through a comparative analysis of domestic and international research trends in cyberchondria, both before and during Covid-19, this paper seeks to delineate future research directions, thereby fostering the progression of this field. Despite the unclear psychological mechanisms underpinning cyberchondria, existing studies underscore certain psychological constructs as risk factors in its development. Given the advancing technology and the escalating integration of the internet into daily life, cyberchondria is anticipated to garner heightened attention and scholarly inquiry in the foreseeable future.

Certainly, further avenues of research in the realm of cyberchondria offer promising opportunities for exploration. One potential avenue involves delving deeper into the intricate psychological mechanisms that underlie cyberchondria. Understanding how individual traits, cognitive processes, and emotional responses intersect in the context of excessive health-related internet searches could offer profound insights into mitigating this phenomenon.

Moreover, investigating the role of digital literacy and health information-seeking behaviors in different demographic groups could be pivotal. Exploring how various age cohorts, socio-economic backgrounds, or cultural contexts influence the susceptibility to cyberchondria might aid in tailoring interventions and educational programs for different populations.

Additionally, longitudinal studies tracking the evolution of cyberchondria over time, especially in the aftermath of significant global

events like pandemics, could shed light on its long-term impact and resilience factors. Examining how the prevalence and manifestations of cyberchondria shift or stabilize post-pandemic could inform strategies for mental health support and resilience-building.

Furthermore, given the expanding role of social media in disseminating health information, research could focus on evaluating the effectiveness of interventions designed to enhance critical appraisal skills and digital literacy among users. Exploring the efficacy of interventions aimed at reducing anxiety related to health-seeking behaviors on the internet could also be a fruitful area for investigation.

These research trajectories align with the growing significance of cyberchondria in the digital age, offering opportunities to deepen our understanding, develop targeted interventions, and promote mental health resilience in an era.

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