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Exploring Digital Platforms for Cognitive Behavioral Therapy: A Bibliometric Review

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ABSTRACT

This bibliometric study explores the extensive body of literature on digital platforms for Cognitive Behavioral Therapy (CBT), examining scholarly patterns, themes, and global contributions to the field. Utilizing Scopus data analyzed through VOSviewer, the study maps out keyword frequency, co-occurrence, author collaborations, and country contributions, revealing key insights into the evolution of digital CBT. The findings underscore a significant shift towards the use of mobile health applications and web-based interventions, highlighting the role of advanced technologies like machine learning and big data in personalizing and enhancing mental health treatments. The study also illustrates robust international collaborations, particularly among leading researchers from the United States, China, and India, who are pivotal in advancing the digital mental health agenda. Despite promising advancements, challenges such as data privacy, the digital divide, and integration into clinical practice persist. The study concludes that digital CBT holds substantial promise for revolutionizing mental health care by improving accessibility and personalization but requires ongoing research and innovation to overcome existing barriers and fully integrate into mainstream health services.

Keywords: *Digital Platforms, Cognitive Behavioral Therapy (CBT), Mobile Health Applications, Web-Based Interventions, Bibliometric Analysis*

1. INTRODUCTION

Cognitive Behavioral Therapy (CBT) is a widely used psychological treatment that has proven effective in addressing a variety of mental health conditions, including anxiety, depression, and post-traumatic stress disorder (PTSD). Traditionally conducted in face-to-face sessions, CBT focuses on challenging and changing unhelpful cognitive distortions and behaviors, improving emotional regulation, and developing personal coping strategies that target solving current problems [1]. However, the advent of digital technology has transformed how therapeutic interventions like CBT are delivered. Digital platforms, such as mobile apps, online programs, and telepsychology services, provide an alternative means to access therapy, overcoming barriers such as geographical limitations and the stigma associated with seeking mental health treatment [2].

The integration of digital technology into CBT, commonly referred to as e-CBT, has shown promising results, offering high scalability and ease of accessibility that can potentially reach underserved populations. Numerous studies have documented the efficacy of e-CBT in treating mental health disorders, often finding it comparable to traditional face-to-face CBT [3]. Moreover, digital platforms allow for the incorporation of interactive elements such as real-time feedback, personalized content, and gamification, which can enhance engagement and adherence to therapeutic protocols [4], [5].

Despite its benefits, the transition from conventional CBT to digital platforms is not devoid of challenges. Issues related to privacy, data security, and the digital divide pose significant barriers to the widespread adoption of e-CBT. Furthermore, the impersonal nature of digital interventions may not suit all patients, particularly those who require more intensive support or have complex mental health needs [6]. Additionally, the rapid proliferation of digital health applications has led to a market saturated with tools that vary widely in quality and effectiveness, making it difficult for both patients and healthcare providers to identify reputable and efficacious programs [6], [7].

The evolution of digital platforms for CBT has also spurred significant scholarly interest, leading to a substantial body of literature that examines various aspects of this innovation. Bibliometric reviews within this domain can provide valuable insights into the trends, gaps, and network of influences shaping the development of e-CBT. Such analyses are crucial for understanding the trajectory of research and practice in this area and for identifying the most influential studies, authors, and research clusters.

Despite the potential of digital platforms to revolutionize the delivery of CBT, there remains a lack of comprehensive bibliometric analyses that consolidate the expansive literature on this topic. Existing reviews often focus on clinical outcomes without considering the broader scholarly landscape that encompasses technological, ethical, and methodological considerations. This gap hinders the development of a cohesive understanding of digital CBT's potential and challenges, limiting the ability to harness its full capabilities to improve mental health outcomes.

The objective of this study is to conduct a bibliometric review of the literature on digital platforms for CBT. This review aims to map the scientific landscape, identify seminal works and emerging trends, and uncover the network of scholarly communications that have shaped the field. By doing so, this study seeks to provide a comprehensive overview that can inform future research directions and guide the development of digital CBT interventions that are both effective and user-friendly.

2. LITERATURE REVIEW

2.1 Evolution and Efficacy of e-CBT

The evolution of Cognitive Behavioral Therapy (CBT) from traditional face-to-face interactions to digital platforms marks a significant transformation in therapeutic methods. This shift has been driven by the increasing accessibility of technology and the growing need for scalable mental health solutions. In their meta-analysis, [8], [9] highlighted the effectiveness of Internet-based CBT (iCBT) in treating a range of psychiatric conditions, noting no significant differences in efficacy when compared to conventional CBT. Similar findings were reported by [10], who emphasized that the flexibility and accessibility of digital platforms could democratize mental health care, particularly in remote or underserved areas where traditional services are scarce.

Moreover, research by [11] has documented the successful application of e-CBT across diverse populations, including adolescents, the elderly, and individuals with physical disabilities. These studies suggest that digital CBT can be tailored to meet the specific needs and preferences of different user groups, which enhances its applicability and acceptance. However, the clinical outcomes associated with e-CBT are highly dependent on user engagement and adherence to prescribed interventions. [12] noted

that the integration of interactive elements such as gamification and real-time feedback could significantly improve these aspects, potentially leading to better health outcomes.

2.2 Challenges in Digital Delivery of CBT

Despite its benefits, the digital delivery of CBT faces several challenges that could hinder its effectiveness and widespread adoption. [13] pointed out that privacy concerns and data security are major issues, as the sensitive nature of therapeutic data requires robust protection mechanisms. Additionally, the digital divide remains a significant barrier; while e-CBT aims to increase accessibility, it inadvertently excludes populations without reliable internet access or technological literacy [13]. The impersonal nature of digital interventions also poses a challenge. A study by [14] found that a segment of patients still prefers face-to-face therapy due to the perceived depth and quality of personal interactions. These findings suggest that while e-CBT is a promising tool, it cannot completely replace traditional methods, especially for those requiring more intensive support.

2.3 Technological Advancements in e-CBT

The continual advancement in technology has led to the enhancement of e-CBT platforms. Modern applications incorporate sophisticated algorithms that personalize treatment plans based on real-time user data, significantly improving the specificity and timeliness of therapeutic interventions [15]. Machine learning models are also being explored for predicting patient outcomes and optimizing therapy schedules, which could lead to highly efficient and effective e-CBT services [11]. Moreover, the integration of virtual reality (VR) and augmented reality (AR) into e-CBT has opened new avenues for treatment. Research by [16] demonstrated the potential of VR-enhanced CBT to simulate real-life scenarios that patients can practice and master, providing a safe environment to confront fears and rehearse coping strategies. This technology not only increases the realism and immersion of therapeutic interventions but also makes them more engaging for the user.

2.4 Regulatory and Ethical Considerations

As digital CBT gains traction, it also encounters regulatory and ethical challenges. The lack of standardized regulations across different regions can complicate the approval and deployment of e-CBT applications [17]. Ethical issues such as informed consent, data sharing, and the potential for misuse of sensitive information are also critical concerns that need addressing. Research by [9] emphasized the importance of developing comprehensive ethical guidelines to govern the use of digital therapy tools, ensuring that they are used responsibly and with due consideration for patient rights and safety.

3. METHODS

For this bibliometric review, data was systematically collected from the Scopus database, focusing exclusively on literature related to the use of digital platforms for Cognitive Behavioral Therapy (CBT). The search strategy was developed to include key terms such as "digital platforms," "e-CBT," "internet-based CBT," "online therapy," and "telepsychology." The criteria for inclusion were articles published in English from 2000 to 2025 that specifically addressed the development, implementation, or evaluation of digital CBT platforms. Articles that did not focus on CBT or were not conducted on digital platforms were excluded. The extraction of relevant data included bibliographic information like publication year, authors, titles, and abstracts, which was

methodically recorded using Excel to organize and prepare the dataset for analysis. The analysis was conducted using VOSviewer, a software tool specialized for constructing and visualizing bibliometric networks. This analysis focused on mapping and examining the co-authorship and keyword co-occurrences within the collected articles to identify the most influential authors and prevalent themes in the field. VOSviewer allowed for the creation of visual network maps that illustrate the relationships between authors, institutions, and keywords, highlighting the central topics and trends over the reviewed period.

4. RESULTS AND DISCUSSION

4.1 Network Visualization

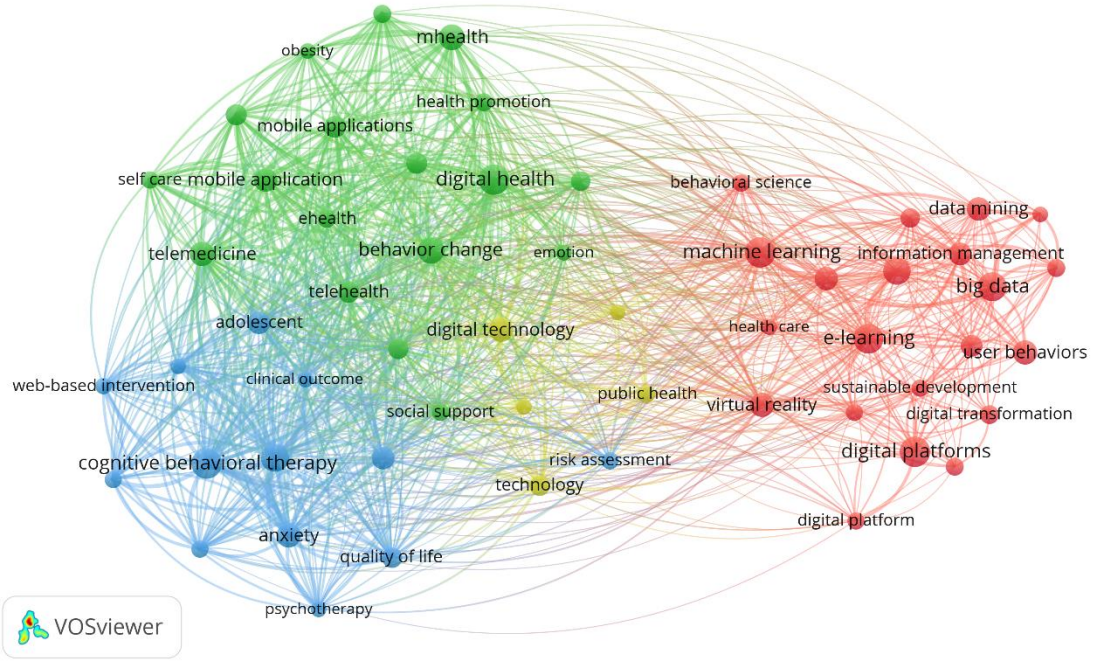

Figure 1. Network Visualization
Source: Data Analysis Result, 2025

The VOSviewer visualization provides a detailed bibliometric analysis of the literature on digital platforms for Cognitive Behavioral Therapy (CBT). The network map vividly displays the relationships and thematic clusters that have emerged from the scholarly work in this field. It is divided into several key clusters, each represented by a different color, illustrating the multidisciplinary nature of research in this area. The green cluster primarily focuses on mobile health (mHealth) and related technologies, including mobile applications and digital health. This cluster indicates a strong interest in how mobile platforms can be used to promote health behaviors and provide telemedicine services. The presence of terms like "obesity" and "health promotion" suggests that much of this research is centered on behavioral changes and health outcomes facilitated through mobile technologies, reflecting the growing trend of using smartphones and apps to deliver health interventions, including CBT.

The blue cluster is centered around "cognitive behavioral therapy" itself, closely associated with "web-based interventions" and "anxiety," pointing to the core applications of digital CBT. This cluster highlights the therapeutic focus of the research, particularly on mental health conditions such as anxiety, where web-based platforms are utilized to deliver therapy. The terms "clinical outcome" and "quality of life" suggest that studies in this cluster evaluate the effectiveness of these interventions, measuring their impact on patient health and well-being. The red cluster, featuring

terms like "big data," "machine learning," "data mining," and "digital transformation," reflects a strong technological and analytical focus. This cluster indicates a burgeoning interest in how advanced data techniques can be leveraged to enhance the delivery and personalization of CBT. It implies a cross-section of digital health and data science, where researchers are exploring how to harness big data and learning algorithms to optimize and perhaps even revolutionize therapeutic practices.

Finally, the intersections of these clusters reveal significant interdisciplinary connections. For example, the overlap between the technology-focused red cluster and the health-oriented green cluster suggests a dynamic interaction between health practitioners and data scientists, aiming to develop new methods and tools for enhancing CBT delivery. This integration points to a robust area of growth within the field, focusing on the convergence of healthcare, behavioral science, and digital technology to improve access, engagement, and outcomes in therapy. The network visualization underscores the complexity and vibrancy of research on digital platforms for CBT. It highlights the critical themes of mobile health, therapy effectiveness, and technological innovation, illustrating how these areas are interlinked to form a comprehensive research landscape. The diversity of keywords also suggests that future research could continue to evolve in multiple directions, further integrating emerging technologies with traditional therapeutic practices to address a wide range of mental health challenges.

4.2 Overlay Visualization

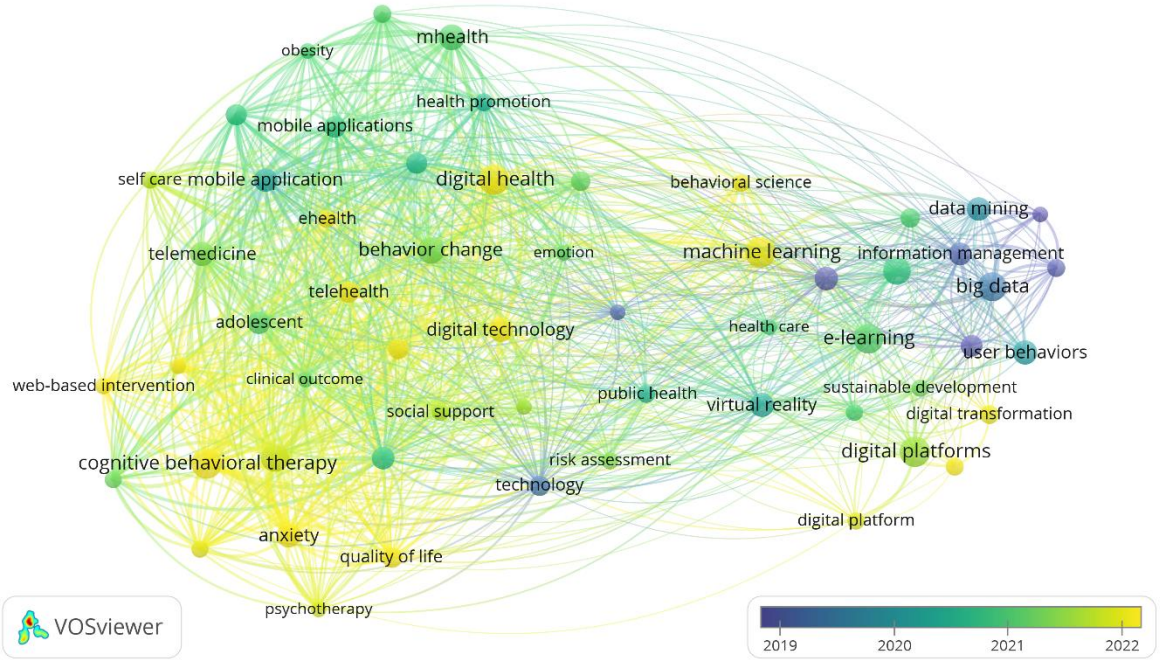

Figure 2. Overlay Visualization
Source: Data Analysis Result, 2025

The second visualization here incorporates a temporal dimension, providing a clearer picture of the evolution and focus areas in research on digital platforms for Cognitive Behavioral Therapy (CBT) over several years. The color gradient from yellow to blue represents the timeline from 2019 to 2022, highlighting shifts in research focus and the emergence of new themes over time. In the earlier part of the timeline, represented by the yellow nodes, there is a strong concentration on foundational aspects of digital health such as "cognitive behavioral therapy," "anxiety," and "web-based intervention." This suggests that initial research efforts were heavily focused on adapting

traditional CBT methodologies to digital platforms, assessing their effectiveness, and exploring their impact on common mental health issues like anxiety. The presence of "quality of life" and "clinical outcome" within this cluster indicates a priority on measuring the tangible benefits of digital CBT interventions, reflecting an early emphasis on proving the efficacy of digital therapies in improving patient outcomes.

As the timeline progresses towards the blue nodes, there is a noticeable shift towards advanced data-driven and technological themes such as "data mining," "big data," "machine learning," and "digital transformation." This transition underscores a growing research interest in leveraging technology not only to deliver therapeutic content but also to enhance the personalization and optimization of therapies through sophisticated data analysis techniques. The integration of "e-learning" and "user behaviors" with these technological terms indicates an interdisciplinary approach, where insights from behavioral science and machine learning are combined to refine digital interventions. This evolution points towards a future research trajectory that increasingly values adaptive, personalized digital health solutions driven by robust data analytics and machine learning algorithms.

4.3 Citation Analysis

Table 2. The Most Impactful Literatures

Citations	Authors and year	Title
456	[18]	Digital Content Marketing's Role in Fostering Consumer Engagement, Trust, and Value: Framework, Fundamental Propositions, and Implications
439	[19]	The Jigsaw continuous sensing engine for mobile phone applications
433	[20]	Social media analytics: a survey of techniques, tools and platforms
395	[21]	Social Data: Biases, Methodological Pitfalls, and Ethical Boundaries
326	[22]	Interventions for Adolescent Mental Health: An Overview of Systematic Reviews
314	[23]	Information filtering: Overview of issues, research and systems
299	[24]	Social media for knowledge-sharing: A systematic literature review
293	[25]	Social media: A contextual framework to guide research and practice
292	[26]	Interventions using new digital media to improve adolescent sexual health: A systematic review
276	[27]	Lifestyle modification approaches for the treatment of obesity in adults

Source: Scopus, 2025

4.4 Density Visualization

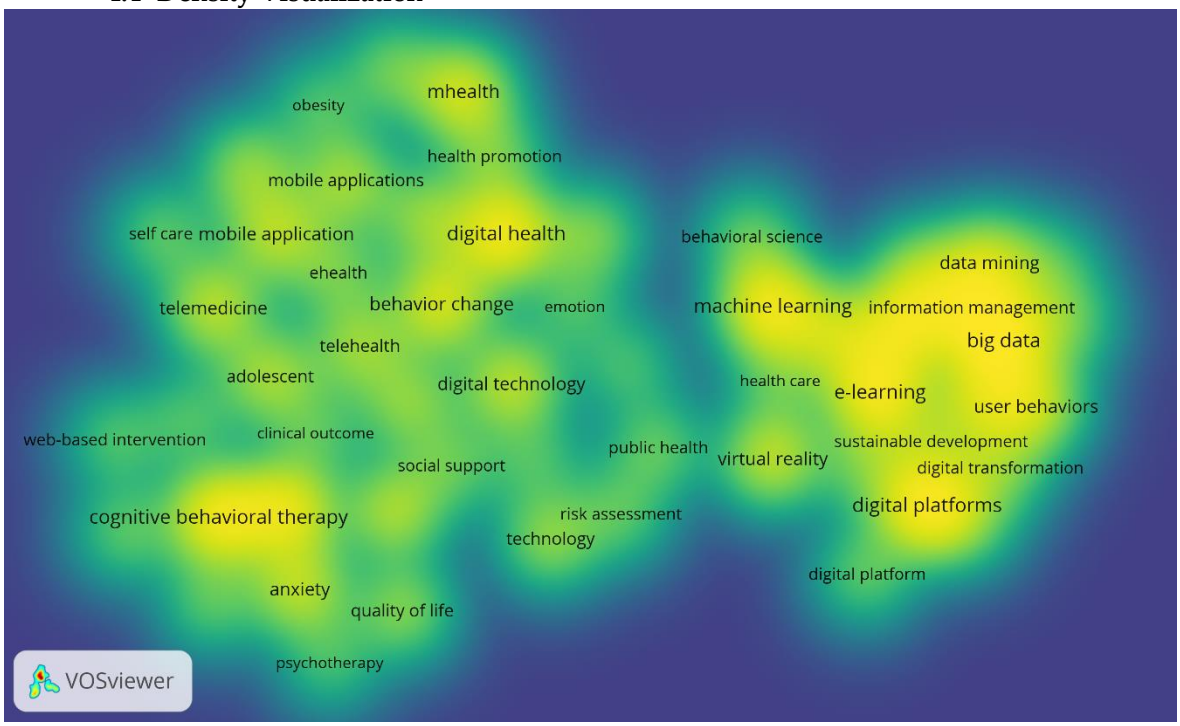

Figure 3. Density Visualization

Source: Data Analysis Result, 2025

This VOSviewer visualization provides a comprehensive map of key research themes and connections in the field of digital platforms for Cognitive Behavioral Therapy (CBT) and related digital health interventions. The visualization categorizes major research topics into clusters identified by distinct colors, representing different facets of digital health. Central themes such as "cognitive behavioral therapy," "anxiety," and "quality of life" anchor the visualization, indicating that these are core subjects of interest within the digital mental health research community. This focus suggests a robust engagement with evaluating the impacts of digital interventions on mental health disorders and patient well-being. Nearby, the presence of "web-based intervention" and "telemedicine" connects directly to these central themes, illustrating the practical applications of digital platforms in delivering therapeutic services. Adjacent to these central themes are clusters that represent emerging and supportive technologies in digital health, including "mhealth," "mobile applications," and "digital health," indicating a significant interest in mobile and web-based applications for health promotion and disease management. These clusters are connected to more technologically advanced topics such as "machine learning," "big data," and "data mining," located on the periphery of the map. This placement suggests that while the integration of advanced data analytics and machine learning into digital health is gaining traction, it remains a developing area that bridges traditional health science with cutting-edge technology.

4.5 Co-Authorship Network

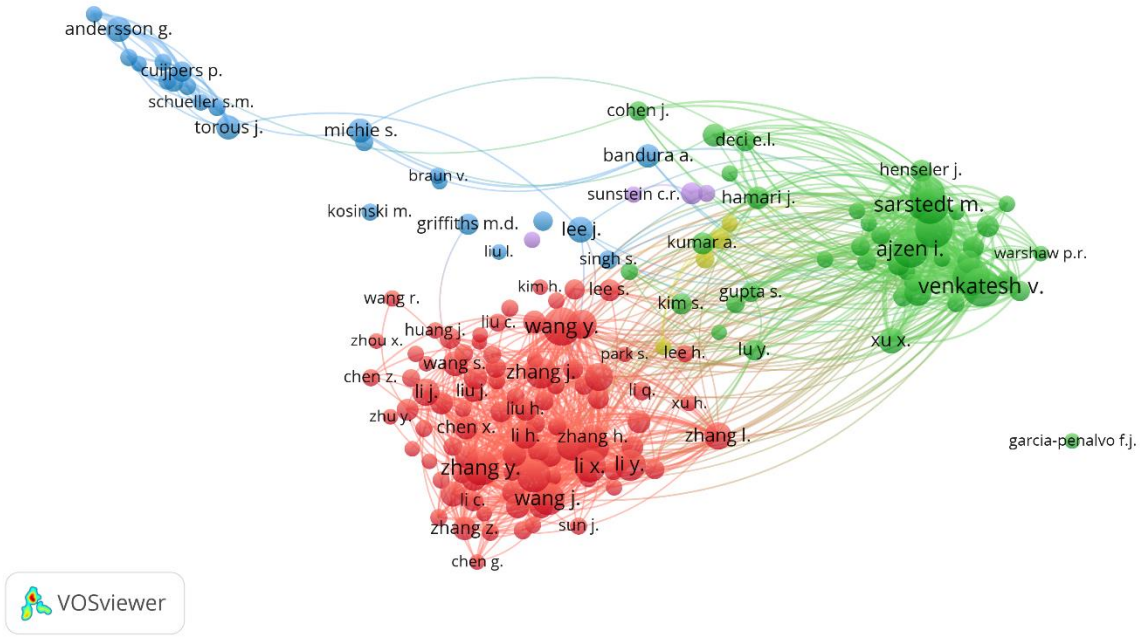

Figure 4. Authorship Visualization
Source: Data Analysis Result, 2025

The map is divided into three primary clusters, each highlighted in different colors representing distinct but interconnected research communities. The blue cluster includes notable scholars like Andersson G. and Cuijpers P., who are recognized for their contributions to internet-delivered psychological treatments and digital interventions in mental health. The green cluster features authors such as Venkatesh V. and Ajzen I., likely representing a focus on theoretical models related to technology acceptance and behavioral intentions, a crucial aspect when evaluating the adoption of digital health technologies. The red cluster is densely populated with authors predominantly from Asian regions, such as Wang Y. and Zhang H., indicating robust activity in digital health research focused on technological innovations and applications in health care settings in Asia.

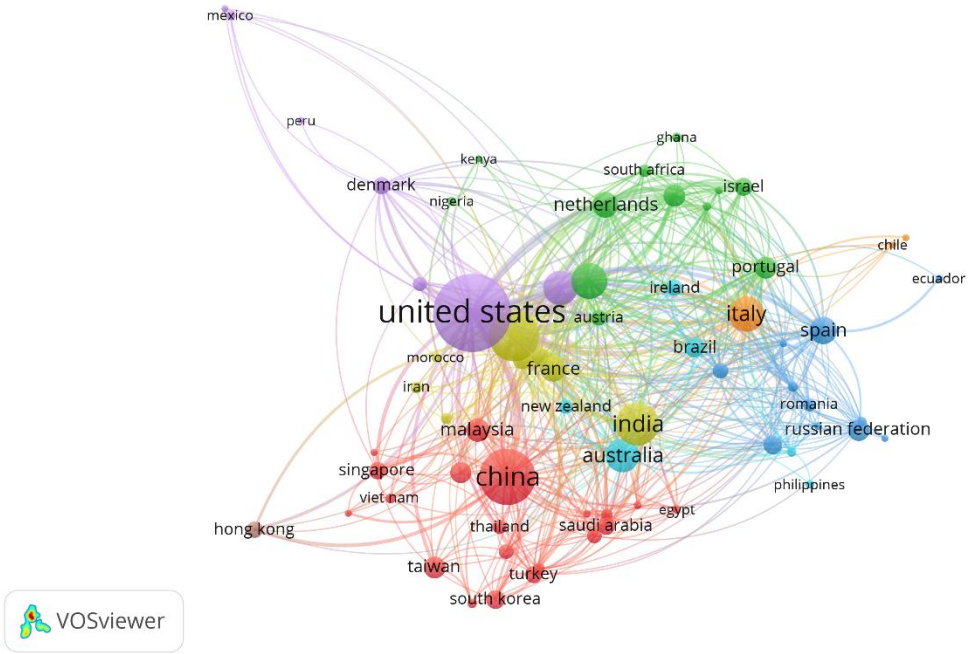

Figure 5. Country Visualization
Source: Data Analysis Result, 2025

The VOSviewer visualization shows a global network of countries involved in health research, highlighting the United States, China, and India as prominent nodes with the largest circles, indicating their major contributions to the field. These countries serve as central hubs in their respective clusters, suggesting a high volume of research output and international collaborations. The interconnections between countries such as the United States and European nations like France, Germany, and the United Kingdom, as well as Asian powerhouses like China and South Korea, underscore extensive cross-border partnerships that likely facilitate knowledge exchange and innovation in digital health technologies. The network spans across diverse geographical regions including South America, Africa, and Oceania, reflecting the universal relevance and collaborative nature of digital health research on a global scale. Smaller nodes for countries like Peru, Kenya, and Vietnam suggest emerging contributions, signaling a broadening interest and growing body of research in digital health worldwide.

Discussion

The bibliometric analysis conducted on the vast body of literature concerning digital platforms for Cognitive Behavioral Therapy (CBT) unveils several key insights and patterns that highlight the evolution and current trends in this field. The data drawn from Scopus using VOSviewer to map and analyze keyword frequency and co-occurrence, author collaborations, and country contributions provided a comprehensive overview of how digital CBT is being integrated into mental health practices globally.

1. Central Themes and Innovations

The research clusters identified through the keyword analysis reveal a significant emphasis on integrating mobile health applications and web-based interventions, indicating a shift towards more accessible and user-friendly mental health solutions. This trend is in line with the broader move within healthcare towards telemedicine and digital health solutions, which has been particularly accelerated by the global COVID-19 pandemic. The focus on mobile applications suggests that

researchers and practitioners are exploring the use of everyday technology to make mental health interventions as accessible as possible, thus aiming to reduce the stigma and logistical barriers associated with traditional therapy settings.

Advanced technologies such as machine learning and big data are increasingly being employed to enhance the effectiveness and personalization of digital CBT. These technologies facilitate the development of adaptive systems that can tailor therapeutic content to individual users' needs in real-time, based on data collected on their progress and engagement levels. Such innovations could potentially transform the therapeutic landscape by making interventions more responsive to individual variations in mental health states and treatment responses.

2. Global Contributions and Collaborations

The geographical distribution of research activity, as depicted in the country collaboration map, highlights the United States, China, and India as pivotal nodes in the network of digital CBT research. This suggests that these countries are not only contributing substantial research output but are also key to international collaborations. The strategic collaborations between countries with robust technological infrastructures and those with emerging research communities can be seen as an effort to bridge the gap between technology development and its practical application in diverse cultural contexts. Moreover, the integration of research efforts from countries across different continents points to a global recognition of the importance of digital health solutions in addressing mental health challenges. These collaborations are crucial for developing guidelines and frameworks that can be adapted for local contexts, ensuring that digital CBT is culturally sensitive and applicable worldwide.

3. Challenges and Barriers

Despite the promising advancements in digital CBT, several challenges remain. Privacy and data security are major concerns, especially as the use of digital platforms involves the collection and storage of sensitive personal information. Ensuring the confidentiality and integrity of patient data is paramount to maintaining trust in digital health solutions. Furthermore, there is a need for ongoing research to address the digital divide that still exists in many parts of the world, where limited access to technology can prevent individuals from benefiting from digital health interventions. Another significant challenge is the clinical acceptance and integration of digital CBT into standard healthcare practices. While research shows the efficacy of these interventions, there is often resistance among healthcare providers to fully integrate digital approaches due to concerns about the therapeutic relationship and the clinical appropriateness of technology-based interventions for complex mental health conditions.

4. Future Directions

Looking ahead, the field of digital CBT is poised for further growth with continuous innovations in technology and methodology. There is a clear trend towards more integrated care models that combine traditional face-to-face therapy with digital interventions to provide a more comprehensive approach to mental health care. This hybrid model could potentially address some of the current limitations of fully digital or fully traditional approaches by leveraging the strengths of both. Additionally, future research should focus on developing and implementing more sophisticated algorithms that can better predict individual treatment outcomes, thus optimizing personalized treatment plans. There is also a growing need to explore the long-term effectiveness of digital CBT interventions across different populations and mental health conditions to better understand their impact over time.

CONCLUSION

The bibliometric analysis of digital platforms for Cognitive Behavioral Therapy (CBT) conducted in this study has highlighted significant trends and contributions in the field, underscoring the growing integration of digital technologies in mental health care. The study identified key themes such as the rise of mobile health applications, the application of advanced data analytics, and the importance of international collaborations. These findings reflect the potential of digital CBT to enhance accessibility, personalize treatment, and improve mental health outcomes across diverse populations. However, challenges such as data privacy, the digital divide, and clinical integration remain significant barriers. Moving forward, it is essential for ongoing research to address these challenges while continuing to innovate and evaluate the effectiveness of digital interventions. The future of mental health care could see a greater integration of digital and traditional therapeutic methods, leading to more comprehensive and accessible mental health services worldwide. This study not only contributes to the academic understanding of digital CBT but also serves as a foundation for future research and development in the area.

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