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Review Article

Impacts of digital media on children's well-being: A bibliometric analysis

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ABSTRACT

The bulk of the literature related to digital media and children exposed various psychologically harmful impacts. This bibliometric analysis is a crucial attempt to document and present existing literature, identify gaps, and recommend further exploring social media's impact on children's well-being. The method "the preferred reporting items for systematic reviews and meta-analyses" is employed to investigate the publication on the impacts of digital media on children's well-being. The data is collected from the Web of Science database, which includes publications published between 2000 and 2023. The final sample consists of 1,037 research publications evaluated using Bibliometrix software. The findings provide insights into how media is a challenge or opportunity for children and their well-being in the modern era. The trends and suggestions in the discussion of digital media's impacts on children's well-being are presented in this study.

Keywords: digital media, children's well-being, social media use, mental health, bibliometric analysis

INTRODUCTION

The lives of people have become more meaningful because of technological advancements. It raises living standards and lessens the workload (Gür & Türel, 2022). Digital tools, thus, have become an essential part of people's daily existence (Harris et al., 2018). Similarly, children's lives now involve digital technologies, which impact their development. A study conducted in 2020 by Eurostat found that 94% of children in the 16-19 age

range use the Internet daily (McDool et al., 2020). A different American study revealed that 92% of children between 13 and 17 use the Internet daily, 24% use it nearly constantly, and 56% use it multiple times daily (Hurwitz & Schmitt, 2020). The same survey states that 64.4% of kids use their smartphones or mobile phones to access the Internet (Hurwitz & Schmitt, 2020).

Children and teenagers use information and communication technologies more frequently due to their enrichment in educational environments (Gür & Türel, 2022). Recent systematic literature reviews, such as the one by Dharejo et al. (2023), have highlighted the complex relationship between social media use and adolescent psychological well-being, noting both potential benefits and significant risks such as social isolation and increased stress levels. This increase raises a crucial concern for children to be protected from online risks, considering their digital rights (Restrepo et al., 2020). Children born and raised in environments where new digital technologies are widely available are becoming increasingly common, known as "digital children" (Radesky et al., 2020). Due to younger children's rapid adoption of touchscreen devices from an early age, they are also known as the "touch generation" (Almuaigel et al., 2021). Children between the ages of two and four can use touchscreen gadgets, like tablets or smartphones, to play games or watch movies (Holly et al., 2023). Parents frequently teach their children to use these devices in dull social settings, like restaurant reservations, waiting areas, and while driving (Bohnert & Gracia, 2021). According to the most recent study on the global spread of the Internet use among youth, one in three users is a child (Eichen et al., 2021).

Children's natural curiosity, combined with their access to digital devices, has created a wealth of opportunities. However, these also carry a risk of negative consequences, e.g., digital technology is developing addictive behaviors in children that raise concerns (Nabi & Wolfers, 2022). Additionally, excessive use of digital devices is depriving young children of activities that are developmentally appropriate and/or physical activity; in other words, the adoption of digital media is replacing customary childhood activities (Benedetto & Ingrassia, 2021; Nabi & Wolfers, 2022). Researchers have been examining whether children's use of social media, like Facebook and Instagram, may impact their well-being ever since the platforms were first introduced (Beyens et al., 2020). Many of these studies have examined between-person associations, specifically looking at whether children who use social media more or less frequently than their peers have higher or lower levels of well-being (Whitlock & Masur, 2019). Hence, there is a need for a comprehensive bibliometric analysis of the literature to find the gaps in the previous studies and the recent trends of literature on social media's impact on children's well-being (Pempek et al., 2010)

Objective of the Study

Worldwide, social media researchers are concerned with the growing screen time among children and, consequently, changes in their social, cognitive and psychological behavior. As already mentioned above, there are a plethora of studies that have discovered inconsistent results and findings. This bibliometric analysis aims to bring together the studies. It provides a visual representation of the current state and trends of research concerning the impacts of social media on children's well-being. However, the following objective and research question are stated:

RO: *To present the current state and research trends related to social media and children's psychological well-being.*

RQ: *What are the current state and trends in research related to social media and children's psychological well-being?*

However, it is pertinent to mention here that the current state of research refers to the number of publications, journals, and authors. Furthermore, the trends are documented in essential issues and effects, and variance in findings and discussion across the globe.

MATERIALS AND METHODS

The preferred reporting items for systematic reviews and meta-analyses (PRISMA) has been designed primarily for systematic reviews and a systematic strategy for exploring, finding, reporting, and discussing the existing literature related to a specific topic or area proposed in 2020 (Parums, 2021; Jiaqing et al., 2023). The current study utilized PRISMA guidelines (which offer comprehensive procedures for beginning the review and producing concrete data (Page et al., 2021; Brony et al., 2024).

Strict adherence to the PRISMA criteria was maintained throughout the selection process to guarantee relevance. Initially, the title was examined to determine its relevance. Subsequently, the abstract was used to summarize the study. Finally, the introduction was evaluated to analyze the study's history, rationale, aims, and research question. The methodology section was seen to have a comprehensive explanation, including the research design, data collecting instrument, and sample approach. Finally, the data and findings were examined, and the discussion and conclusion were scrutinized to identify the limits and provide suggestions for the research. Furthermore, specific research is categorized based on geographical regions for differentiation.

The data was collected on 14 February 2024, and purposive sampling was used to remain focused on the study's objective.

The search terms were identified based on the topic and objectives of the study. The following key terms were employed for both Scopus and Web of Science (WoS) databases.

- **Digital media:** Digital media refers to content created, distributed, and accessed via digital platforms. This includes social media, video games, online videos, educational apps, and other digital content children interact with on devices like smartphones, tablets, computers, and gaming consoles.
- **Social media:** Social media refers to social networking sites, such as Facebook, Instagram, TikTok, Snapchat, etc.
- **Well-being refers to children's physical, emotional, social, and mental health:** In this regard, theoretical frameworks, such as psychological and subjective well-being, are reviewed, explaining diverse impacts. In this context, the included aspects are mental health (e.g., anxiety, and depression), physical health (e.g., sleep patterns, and physical activity), social well-being (e.g., relationships with peers), and cognitive development.
- **Impact refers to digital media's effects or influence on various aspects of children's well-being:** This could include both positive and negative impacts, such as the role of social or digital media in learning versus the potential for social media to contribute to anxiety or cyberbullying.
- **Children:** In the context of this analysis, children are defined as individuals aged 18 years and below.

Adhering to the PRISMA checklist avoided problems like redundancy and biases. The PRISMA criteria are also shown in a graphic comprising four distinct steps: "identification, screening, eligibility, and inclusion".

1. Identification is a meticulous process of identifying relevant studies for review. In this review, the researchers conducted an extensive search across numerous databases, including sources of grey literature, to compile all possible studies. This phase involved careful selection of keywords, implementation of precise search techniques, and systematic organization of the records. All studies that were discovered, including any duplicates, were meticulously documented for later removal.
2. Screening is the second step, where identified studies are carefully filtered and determined for eligibility. In this stage, researchers meticulously reviewed the titles and abstracts of all identified studies to exclude those not meeting the predefined inclusion criteria. Duplicates identified in the previous stage were removed. This stage ensured that only the most relevant studies moved forward to the next stages, maintaining the precision of the research.
3. Eligibility is the third step in PRISMA, which helps the research finalize studies for review. The full-text articles of the studies that successfully pass the screening step are obtained and thoroughly evaluated based on the predetermined criteria for inclusion and exclusion. Studies that fail to fulfill the specified criteria are not included, and the reasons for their absence are recorded. This step involves further refining and selecting the most relevant and suitable research.
4. The last step in "Inclusion" is to include the studies that pass the eligibility assessment in the final analysis. The data from these studies are extracted, synthesized, and analyzed to answer the research question. The flow diagram is completed to show the number of studies at each stage and the reasons for exclusions.

For the current analysis, PRISMA, all steps are followed and explained below in detail.

Table 1. The summarized search strategy and keywords for WoS

No	Construct	Search field/limits
#1	Children OR child OR adolescents*	TS: Topic
#2	"social media" OR "digital technologies" OR "digital media" OR "online platform" OR "social media use" OR "internet use" OR "electronic media" OR "online teaching"	TS: Topic
#3	Well-being OR wellbeing OR "mental health" OR happiness* OR welfare	TS: Topic
#4	2000-2023	PS: Year published
#5	#1 AND #2 AND #3 AND #4	Language: English, Subject area: All, & Documentation type: Article

Database

The WoS database, comprising an extensive library of more than 9000 critical scholarly publications, was utilized in this study to retrieve data (Alryalat et al., 2019). The WoS is one of the largest and most comprehensive academic databases in the world, and The WoS core collection is the most used citation database for bibliometric analysis. WoS can provide annual output, author, journal, institution, country or region, language, and funding information. There are a variety of software options for document visualization, such as CiteSpace, HistCite and VOSviewer (Kasavan et al., 2021). The WoS has been a mainstay of academic research and has a considerable amount of sway within academic communities (Franceschini et al., 2016). Its feature for quantitative analysis made it easier to find different kinds of information about academic publications (Zhu & Liu, 2020). This contained information on the number of papers published annually, the number of papers published by geographical region, popular journals, publishing clusters that are regularly used, most important keywords, and highly cited and downloaded literature (Boer et al., 2020).

Search Strategy

Initially, a search plan was drafted for the WoS to find published, peer-reviewed research on "Impact of digital media on children: Challenges and limitations in their well-being" given in **Table 1**. To thoroughly investigate the research title, the search strategy included the following components: "children" OR "child" OR "adolescents" AND "social media" OR "digital technologies "OR "digital media "OR "online platform" OR "social media use" OR "internet use" OR "electronic media "OR "online teaching" AND "well-being" OR "wellbeing" OR "mental health" OR "happiness" OR "welfare". The time specified for the search was 2000 to 2023. These keywords led to the identification of 2,894 publications in total. Of these, 4 were excluded based on duplication. We got 2,111 articles after data cleaning and 1037 articles left behind after reading the titles and abstract for filtration. Therefore, 1,037 articles were chosen for further consideration under the research topic, demonstrating their alignment with the research questions. The PRISMA flowchart (Takkouche & Norman, 2011). **Figure 1** depicts how bibliometric criteria have been prepared to enhance bibliometric analysis and guarantee clarity and transparency. Initially, we did not include registers or automation tools during the identification stage.

Search Methodology

The whole study was conducted in three stages:

1. **Searching:** The articles were searched using the strategy given in **Table 1**.
2. **Filtering:** The chosen papers underwent screening based on inclusion and exclusion criteria given in **Table 2**, and based on the screening results, they were further filtered and limited for in-depth analysis.
3. **Analysis:** Cite Space (6.2.R2), Bibliometrix (Alryalat et al., 2019), and Microsoft Excel (2019) software was used to perform bibliometric analysis, statistical analysis, and network visualization of authors, organizations and geographical distribution, important clusters, topics and keywords, and their chronological trends. Cite Space is found to be useful for classifying topics into clusters and defining the words' spatiotemporal context. Descriptive statistics were employed to examine the topic's publication geography and frequency.

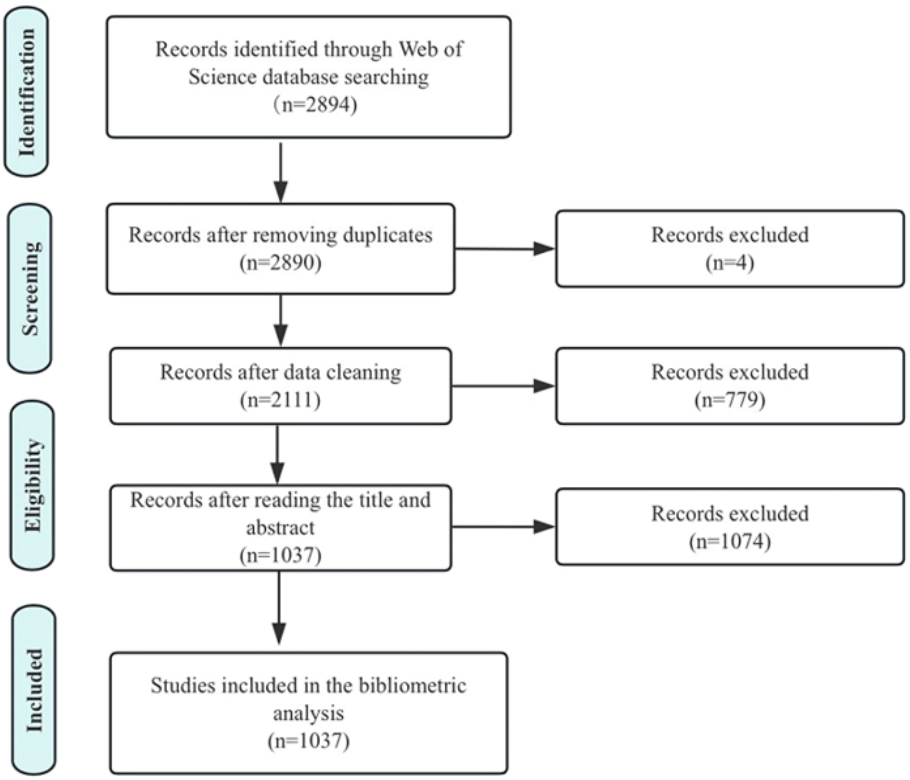

Figure 1. The search strategy for the inclusion of articles in our analysis (Source: Authors)

Table 2. The inclusion and exclusion criteria for the initial screening of articles

Inclusion criteria	Exclusion criteria
Research needs to focus on children's well-being in online environments. Define adolescents (10-19 years old) and children (up to 18 years old)	Literature is not directly related to the research topic and does not address the well-being of children or adolescents in online environments.
Include quantitative studies, qualitative studies, case studies, review articles, systematic reviews, and meta-analyses.	The research focuses only on non-children's groups, youth, college students, adults, older adults, people with disabilities, parents, caregivers, and other groups in the study.
Studies were published within the last 20 years to ensure relevance and currency. (2000-2023)	The focus was only on the well-being of children and did not focus on social media or digital technology.

RESULTS

This study aimed to investigate the current state and trends in literature about children and their well-being.

State of Existing Literature

First, the state of existing literature is presented. Below, the results present the state of the existing literature on the impacts of social media on children's psychological well-being.

Increase in publication

The first finding addresses the publication of studies and distribution of literature about children and their well-being between 2000 and 2023. **Figure 2** illustrates that the quantity of documents produced increased during this twenty-three-year period.

Prominent Journals

The second aspect of the existing literature focuses on journals, which focus on publications on the well-being of children in the digital era.

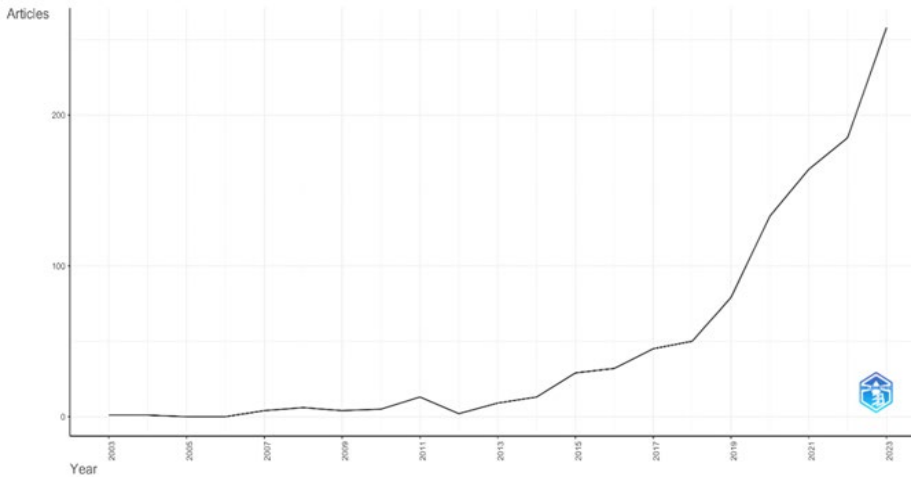

Figure 2. Annual scientific production (Source: Generated by authors using Bibliometrix)

Table 3. The top ten journals on the frequency of published articles on the impact of digital media on children

Journal name	Articles	Publisher	h-index
International Journal of Environmental Research and Public Health	45	MDPI	198
Frontiers in Psychology	40	Frontiers Media SA	184
Computers in Human Behavior	36	Elsevier	251
Journal of Adolescence	25	John Wiley and Sons Inc.	135
BMC Public Health	19	BioMed Central Ltd.	197
JMIR Mental Health	16	JMIR Publications Inc.	55
Cyberpsychology Behavior and Social Networking	15	Mary Ann Liebert Inc.	180
Children and Youth Services Review	14	Elsevier Ltd.	115
Journal of Adolescent Health	14	Elsevier Ltd.	193
PLoS ONE	14	Public Library of Science	435

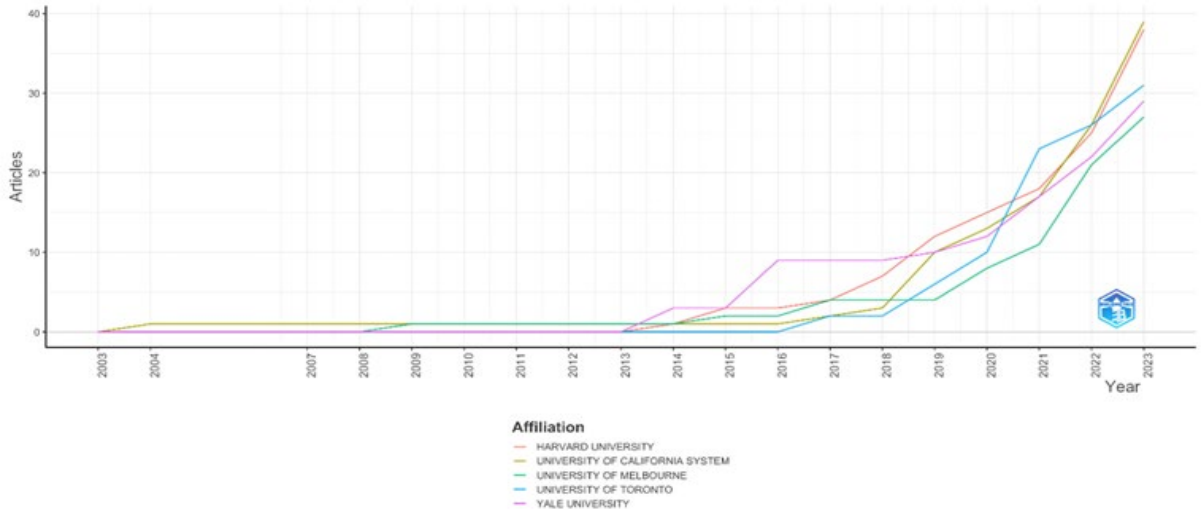

Figure 3. Affiliation's production over time (Source: Generated by authors using Bibliometrix)

Table 3 displays the list of journals which frequently publish articles and research studies about the impact of digital media on children in literature. The top ten journals that frequently published this subject were found by searching the WoS database. **Table 3** displays journal information, including total publications, h-index, and publisher name.

Influential Authors and Affiliation

The last aspect of the state of existing literature reflects the most influential authors and their affiliations about the mental well-being of digital children. **Figure 3** illustrates a significant increase in article production from 2003 to 2023 among five universities: Harvard University, University of California System, University of

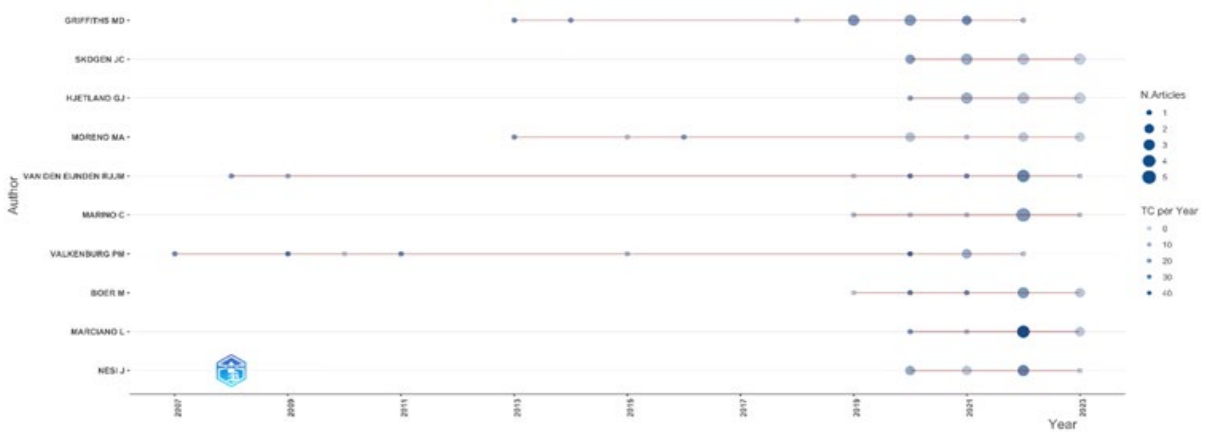

Figure 4. The author's production over time (Source: Generated by authors using Bibliometrix)

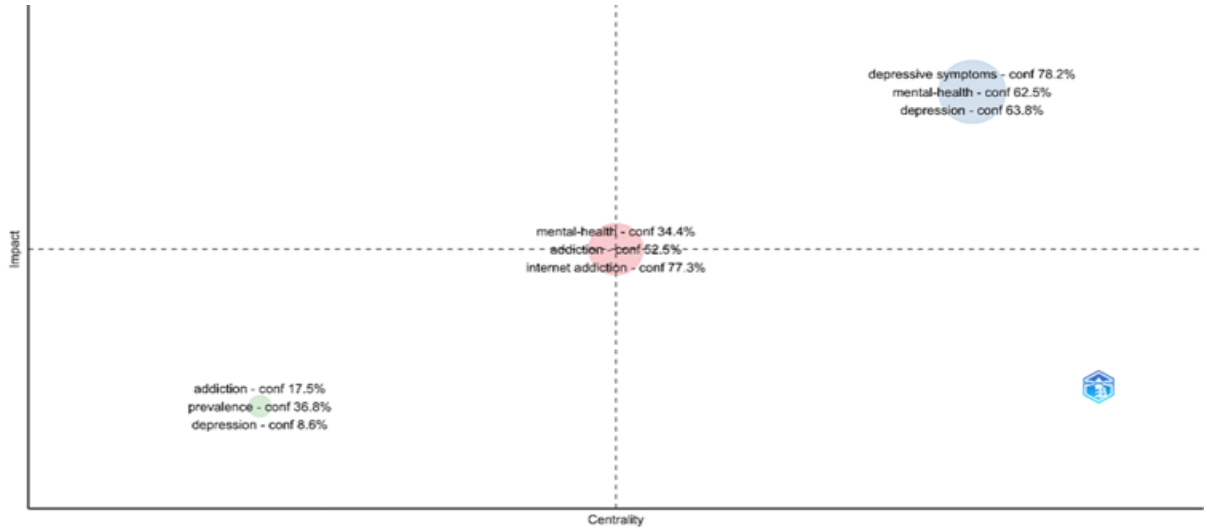

Figure 5. Clusters by documents coupling (Source: Generated by authors using Bibliometrix)

Melbourne, University of Toronto, and Yale University. All depicted have an evident trait in a significant rise between 2013-2015, and the most important expansion follows 2015. First among the other schools, Harvard University graduates most scholars and heads of state, with its results exceeding after 2018. Next is the University of California System and the University of Toronto. Growth of competition is shown in this data trend, which is signaled by a marked rise in the listed institutions in recent years, probably due to boosted research initiatives in addition to global events like the COVID-19 pandemic, which might have encouraged more publications.

Figure 4 is interpreted as a trend of authors' assignation and influence throughout 2007 - 2023. The growth of research output has become especially noticeable in Griffiths, M. D., and Skogen, J. C. These authors have significantly increased their papers since about 2020-2022, and citations also deserve notice. However, almost all authors reveal considerable activity relating to the period after 2017, posing that recent papers are of much higher necessity and influence. Note how the size and intensity in the color of the bubbles correlate to the number of articles and total citations, with Griffiths, M. D. and Skogen, J. C. leading in the number of articles while the latter is at the top of the citations tally.

Trends in Existing Literature

To examine and document the trends in the existing literature about social media impacts on children's psychological well-being, the issues and effects among the studies and locations where these studies are identified. To begin with, research subject and location, the results are presented in clusters. Research subjects forming close or large clusters are graphically shown in a chart called "clusters by documents coupling", considering the papers' centrality and the impact of the cluster (**Figure 5**).

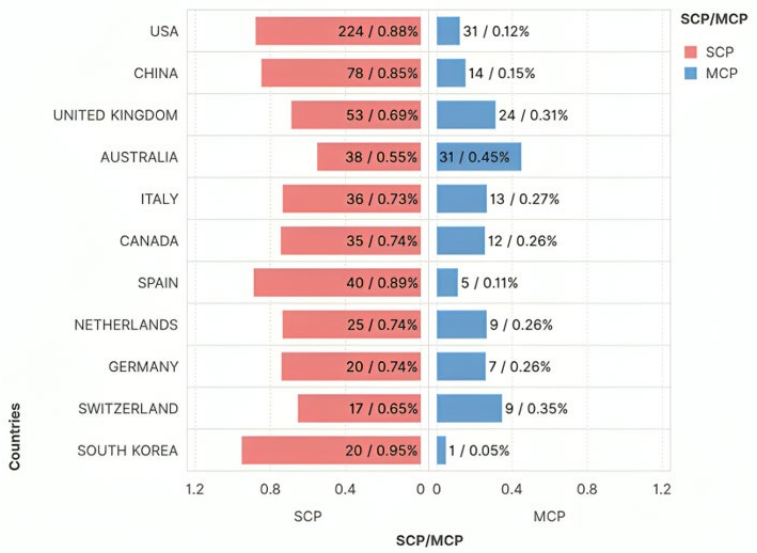

Figure 6. Corresponding author's countries (Source: Generated by authors using CiteSpace)

The first cell is right at the top, which is a high-impact & and central topic like "depressive symptoms". The results showed that "mental health" at 62% was the most popular choice and the least certain, which was not a far discrepancy with a 2% confidence interval. "Moderation" constitutes 23.2% of all sentences, "smoking" has 17.7% sentence proportion, and "depression" is represented in the corpus by 63.8%. The central group, with a moderate degree of category centrality and impact, is composed of the conceptual element of "mental health" and "addiction".

Furthermore, another advancement is in the field of digital marketing for consumer business, where a company hopes to build its audience and drive sales through social media platforms (20.5%) and "internet addiction" (77.8%). "Addiction" (17%) is the lowest impact and centrality point among all the mentioned topics. 5%), "prevalence". The article "Study shows high publication rates for symptoms of depression and mental health issues: "Positive" symptoms (8.1%) and "depression" (8.6%) are the most recorded. The distribution of these figures emphasizes that research on depression symptoms and mental health is both influential and central in the field.

Furthermore, we tried to find out the most important regions or countries writing on this current topic of digital children and their well-being. The chart below in **Figure 6** symbolizes the number of documents authored by scholars from different countries with SCP or MCP publications (single country or multiple countries). The USA has been the country that publishes the most such articles, with SCP being the document type that accounts for the majority. Besides the EU and the USA, China and the UK are also the runners-up, having a solid presence in both SCP and MCP. Australia, Italy, and Canada make an immense contribution to this, and an indication of this cooperation can be seen from the fact that a large percentage of their output is transmitted through the SPII. Countries such as Spain, Netherlands, Germany, and Switzerland are given equal contributions to the SCP and MCP, meaning that international collaborations complement national endeavors. These numbers, however, shed some light on the fact that the overall output is dominated by the USA, which, nevertheless, is an international collaboration mostly concentrated in Europe and the commonwealth countries.

The graph "country production over time" in **Figure 7** illustrates the development of several pieces that came from Australia, Canada, the UK, the USA, and China from 2003 to 2023. China presents an explosive growth of article production where, mainly post-2014, looking like a linear rid does far better than other countries. The USA, given that it is the manufacturing sector and while consistently producing a high number of articles, has a slower growth rate but maintains its number 1 status as a big contributor to global industrial production. Regarding the UK, Canada, and Australia, growth rates were also observed for the research output data, but at lower levels compared to China and the USA. This phenomenon serves as a manifestation of the fact that the last decade has witnessed China's academic research growth.

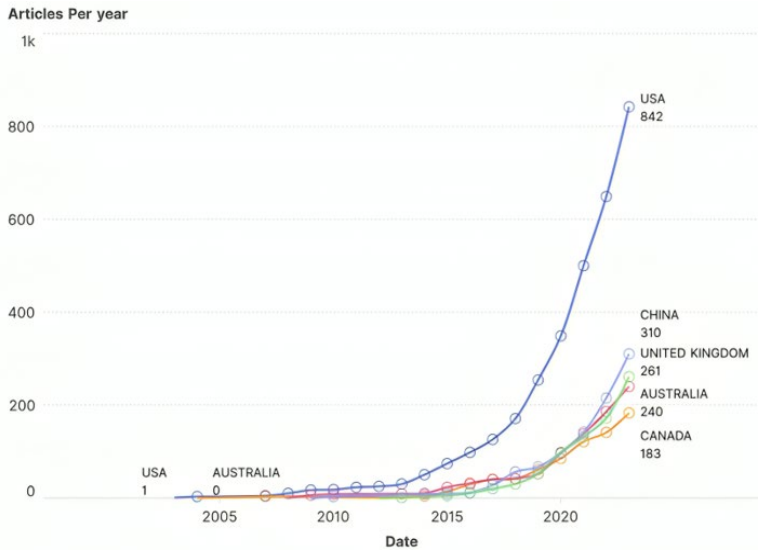

Figure 7. Country's production over time (Source: Generated by authors using CiteSpace)

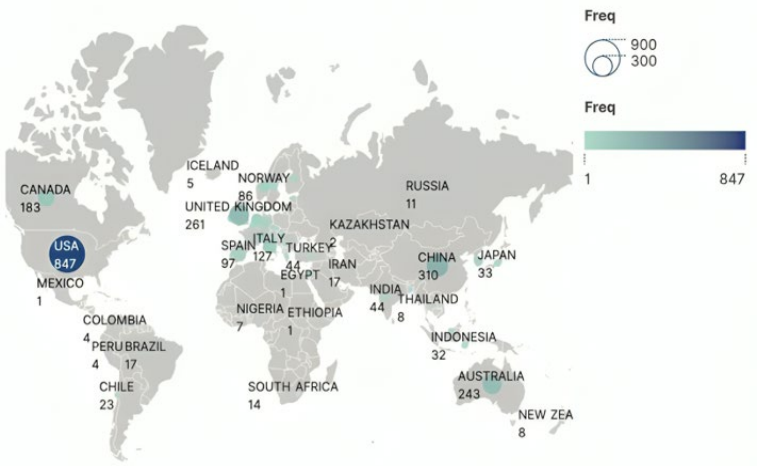

Figure 8. Scientific literature production on the impact of digital media on children (Source: Generated by authors using CiteSpace)

The map in **Figure 8** illustrates the worldwide distribution of scientific production, where darker colors denote the highest levels. The USA, on the top, is the main contributor, while the EU, the UK, Germany, and France portray a clear picture with other nations, e.g., Canada, Australia, and Japan. Brazil and Argentina, along with some African countries like South Africa and Egypt, also contribute a small part, but their significance in this area is relatively small. The digestive table represents a significant focus on research activities in North America, Europe, and East Asia, as well as a service provisioning break within some regions of Africa as well as parts of the Middle East and Central Asia.

The USA has the first position ahead with 9,254 citations, followed by the UK, which squeezes into second place with 4,820 citations, and the Netherlands plunges to third place with 3,829 citations, as depicted in **Figure 9**. The nations outside Europe, such as Australia (912), China (630), and Canada (542), demonstrate more citation impact, albeit lower but significant levels. There are other countries, such as Switzerland, whose number has been downsized to approximately (167) while Italy and Spain have (109 and 95, respectively). Similarly, the number of Belgian citizens (70) in their country is below the average. Attached herewith, this data reveals the UK and the USA dominance as publications that significantly influence the nature of their research, along with considerable contributions from Europe and other commonwealth countries.

Along with that, the citations relevant to each subject area and the highly cited documents are documented. **Figure 10** illustrates that the first book was Hale, L.'s 2015 article in "Sleep Medicine Reviews", which had 723 citations.

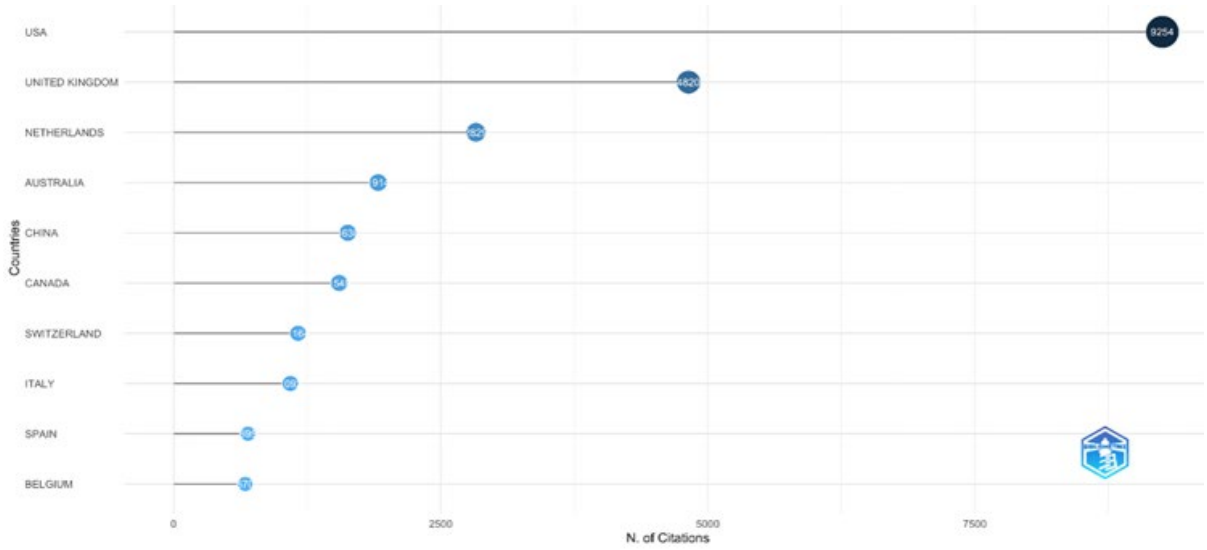

Figure 9. The most cited countries (Source: Generated by authors using Bibliometrix)

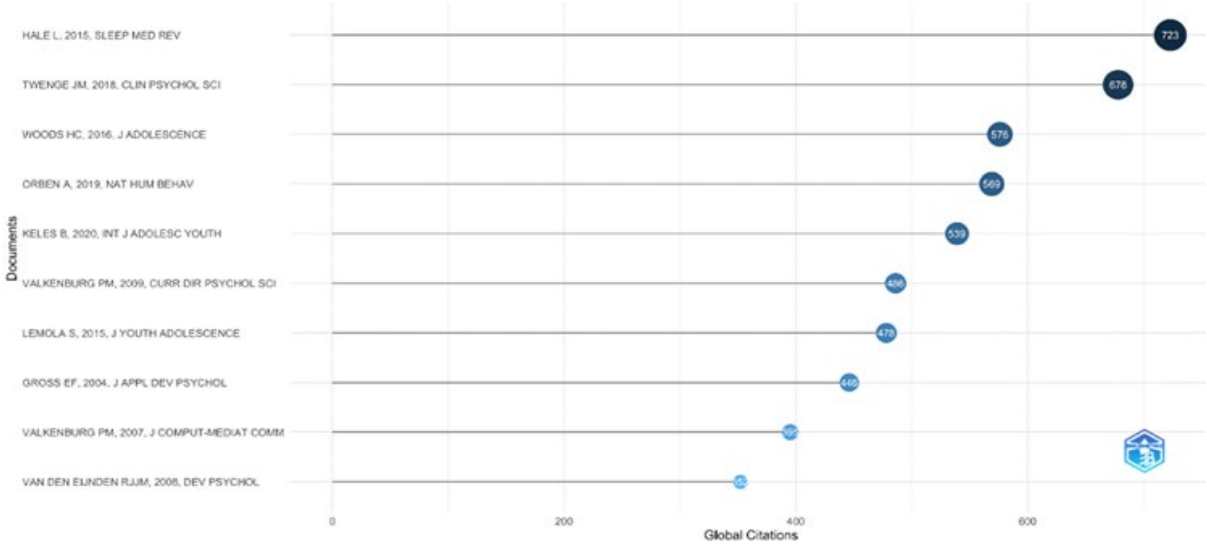

Figure 10. The most cited global documents (Source: Generated by authors using Bibliometrix)

The second most cited document was Twenge, J. M.'s 2018 paper in "Clinical Psychological Science" with 678 citations. Other frequently referenced articles include Woods, H. C. (2016), 'The seduction of digital technology amongst adolescents: A review of the literature', in the Journal of Adolescence with 576 citations, Orben, A. (2019), 'Is there a link between digitally stimulating childhoods and rising mental health issues in adolescence?', in Nature Human Behavior and 56. These documents address a range of disciplines through psychological and behavioral research.

In **Figure 11**, the black line shows how many references were cited during this period, and the red line shows the deviation from the mean of 5 years. The fluctuation in graphs of cites shows a sudden rise as early as 1995, with a sharp peak between 2010 and 2015 before it gradually came down toward 2020. This peak suggests that the intensity of spectral studies increased considerably during this period, which means that the amount of spectroscopy scientific research and citation market rose significantly. The departure from the 5-year average (red line) corresponds to this trend, and it provides this information. This reflects the noticeable peaks in citations in the last few years.

Figure 12 lays out the variations in citations from 2003 to 2023. The beginning segment shows an impressive surge, coming to a maximum near 2004, which is slightly above 20 references for each year. This phenomenon, nevertheless, goes along with a decrease in the average citation count by 2007, followed by a line of positive and negative fluctuations and peaks when needed.

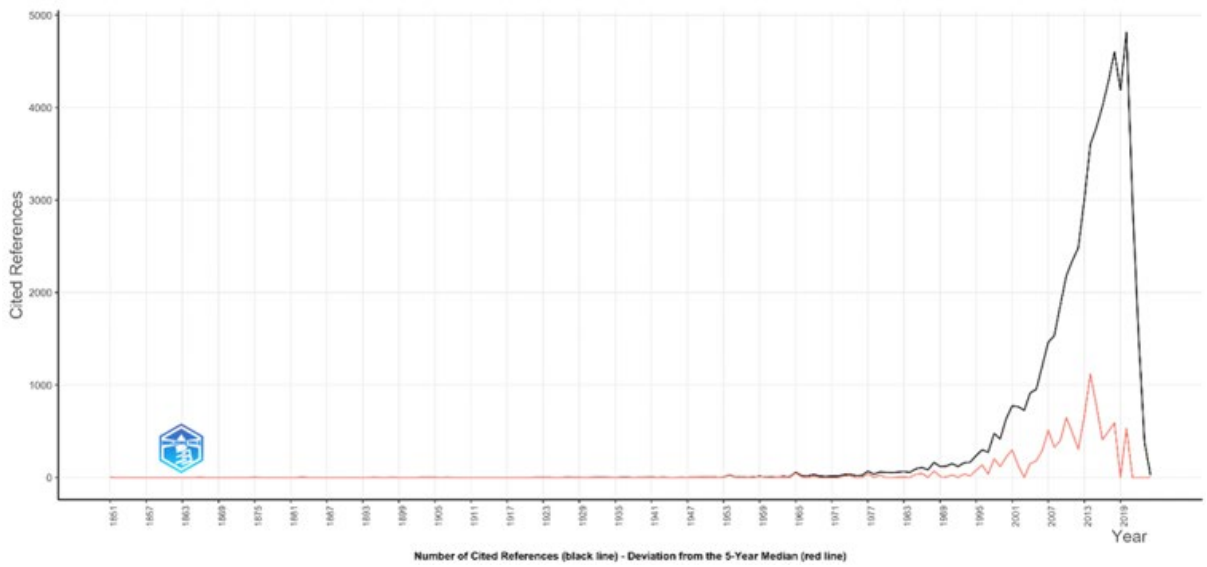

Figure 11. Reference publication year spectroscopy (Source: Generated by authors using Bibliometrix)

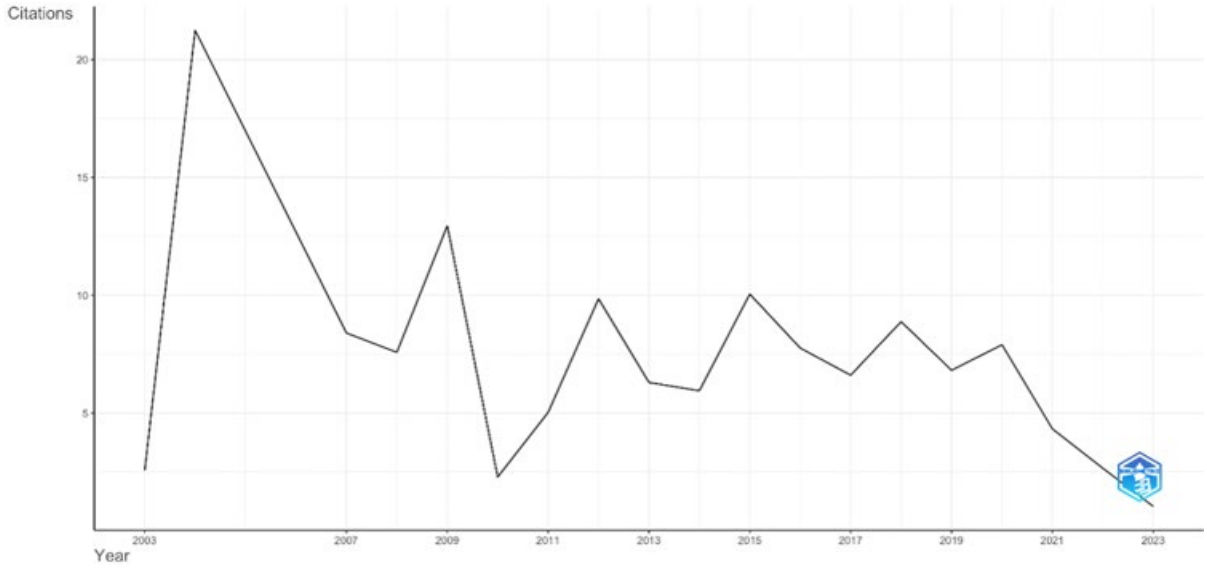

Figure 12. Average citations per year (Source: Generated by authors using Bibliometrix)

Notable peaks were the years 2010, 2015, and 2017, with the average citations around 10 to 15 per year. The last five years, in particular those after 2020, had a noteworthy drop-in citation rate, estimated to sink around 3 times per year at the lowest in 2021. In this regard, it shows a lowering efficiency of publications or a diminishing number of article citations.

The visualizing scheme in **Figure 13** represents interconnections among authors, articles, and keywords as a node and edge in a network analysis. For instance, Skogen, J. C., Hjetland, G. J., Odgers, C. L., and Van den Eijnden, R. J. J. M. are main contributors to frequently cited articles by authors including Nesi, J., Twenge JM, Orben A, among others, belonging to subjects like social media, adolescence, and mental health. Findings are captured in keywords such as "youth," "social media," "depression," and "internet addiction," which are the ones that best describe the research area. The exhibitor shows how the same subject matter and different authors are interconnected, which in turn highlights the focus on the mental health of adolescents and technology's role in that.

From this analysis, we learn the most common terms, including the keywords of social media, behavior, self-esteem, and technology, which means there are research priorities on the psychological impacts of the Internet and social media on children and adolescents.

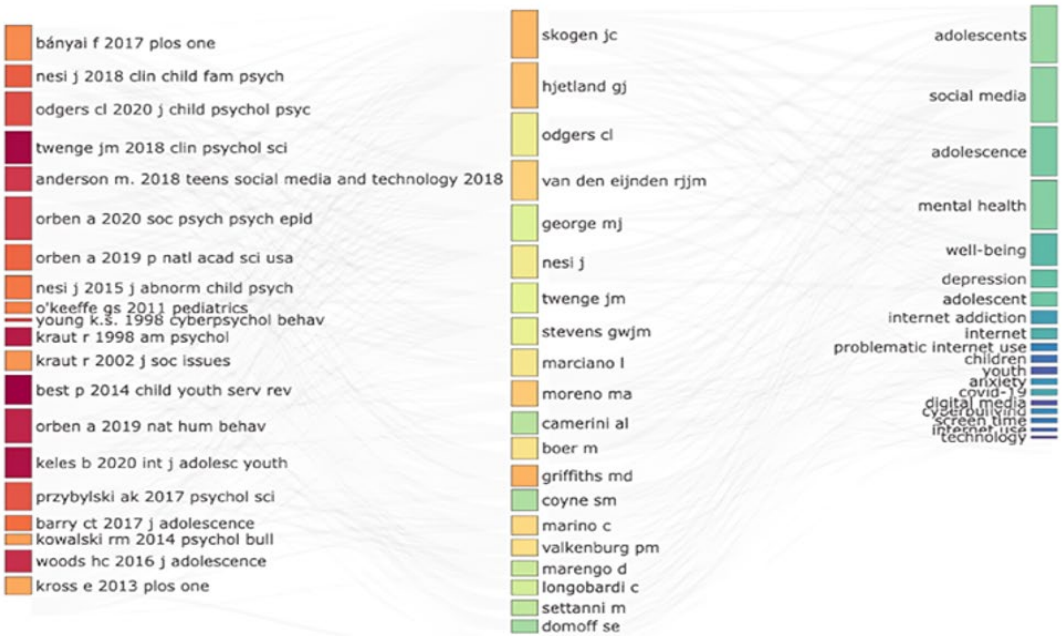

Figure 13. Interaction among articles, authors, and keywords (Source: Generated by authors using CiteSpace)

Figure 14. The most important keywords and their association (Source: Generated by authors using CiteSpace)

The tree map in **Figure 14**, clarifies the most important keywords in the research, showing their frequency and importance relatively. "Mental health" keyword, with 201 cases (6%), is the most eminent, followed by "adolescents", with 178 cases (5%), "depression", with 174 cases (5%), "children" with 165 cases (5%), and "addiction", with 156 cases (5%). Health keywords repeatedly represented in the collection include "prevalence," "symptoms," "internet use," "anxiety," "online," "health," and "social media," which accounted for 2-3 percent of the total. It follows that the mental health effects of the use of the Internet and social media are the pivotal program, together with the topics of addiction, self-esteem, health and physical activity, which are also in the frame.

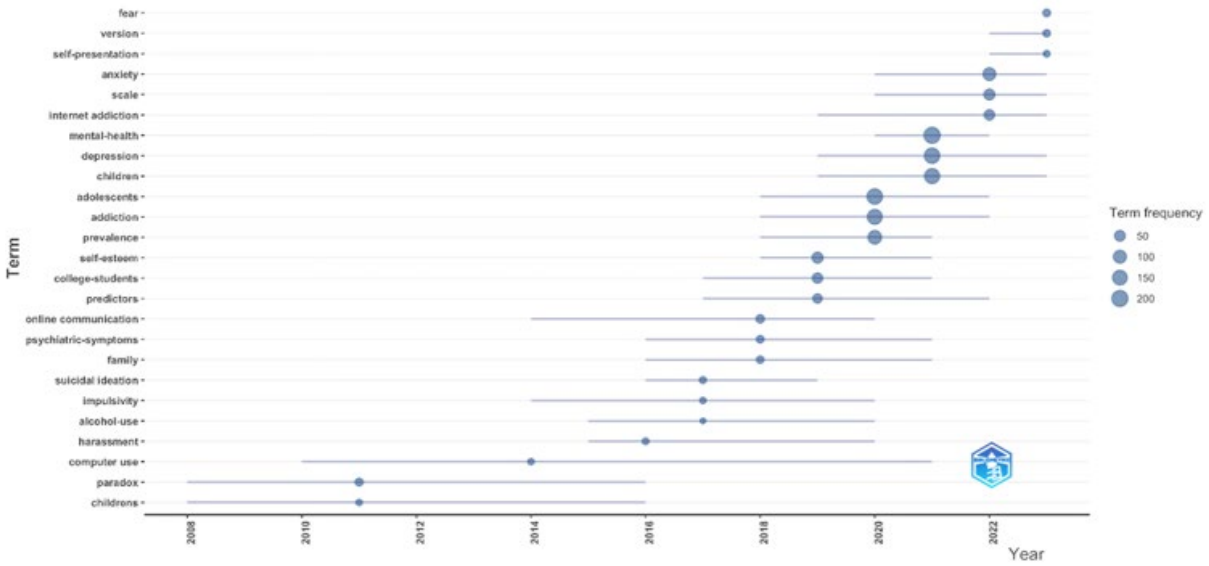

Figure 15. The most trending topics on digital children and digital media (Source: Generated by authors using Bibliometrix)

Figure 16. The most frequently used keywords (Source: Generated by the authors using CiteSpace)

A glance at the "trend topics" section has helped us visualize the frequency and dynamics of research-driven words (**Figure 15**). Such words as mental health, depression, adolescents, children, addiction, and self-esteem can easily be found in the latest news and data. The most frequent words are those mentioned above, which have been increasingly used, especially in previous years. The number of words that denote "internet addiction", "online communication", or any other related concept per year used extensively by scholars rises significantly hence highlighting the growing interest in digital media impact. The chart shows an increasing need to focus on mental health issues approaching digital and online behavior, with the bigger bubbles representing higher term frequency, especially since 2015.

The trellis displays the most frequent keywords in research papers, with bigger words corresponding to higher usage (**Figure 16**). Phrases include "adolescent mental health," "children with depression," "addiction in children," and "widespread problems," with the latter phrases indicating primary research lines in recent studies. The other most used terms like "anxiety, "social media, "internet usage, "online, "self-esteem, and "behavior," which also appear recurrently, indicate how vast the studies are on digital media and the Internet usage that affect adolescent's mental health. The visualization in the picture conveys the thematic areas of mental health, online behavior, and the children's worrying conclusions.

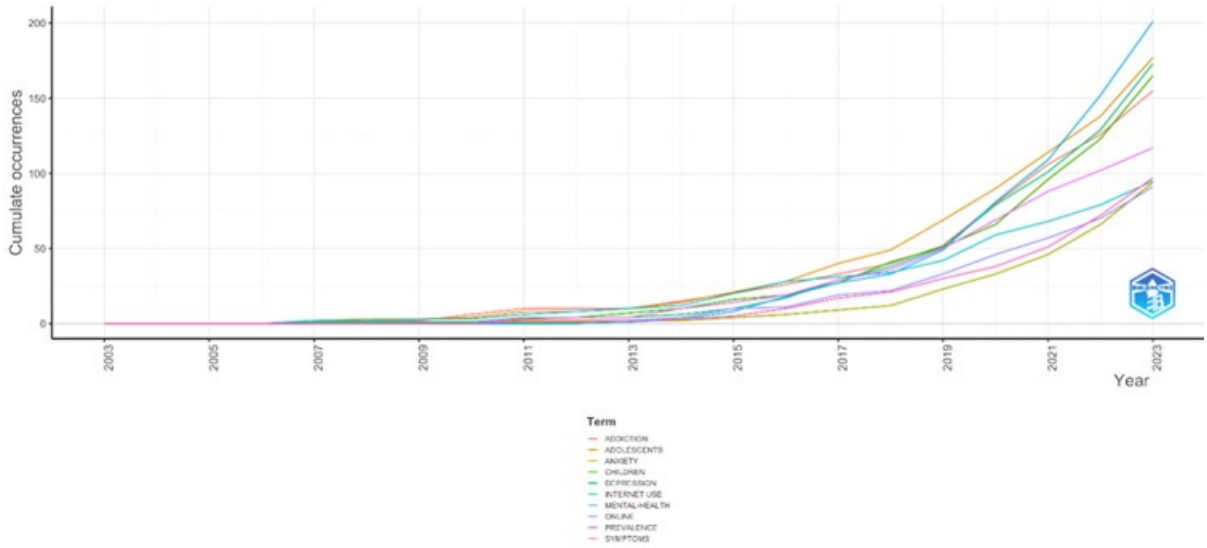

Figure 17. Word's frequency over time (Source: Generated by the authors using CiteSpace)

In **Figure 17**, the finite terms that were used most often in different articles from 2003 to 2023 are represented. The request will follow the terms "addiction," "adolescents," "anxiety," "children," "depression," "internet use," "mental health," "online," "prevalence," and "symptoms." "All periods display a consistent strong trend over time, attaining their peak in the middle of 2015." The number of times words such as "mental health", "adolescents," and "depression" are mentioned more than 200 times peaked by the beginning of next year, 2023, making them the most frequently occurring terms. This phenomenon is indicative of the increased attention paid to psychological health implications, with a special reference to teenagers and the things they do on the Internet.

DISCUSSION

The current bibliometric analysis is an academic effort to combine and present the existing studies on social media's impacts on children's psychological well-being. The PRISMA strategy is adopted to make this review more systematic and reliable. Furthermore, the analysis presents the state and trends to provide better insight into existing literature and infer results. However, the results revealed an increase in the number of publications, which implies that children's psychological well-being in the digital era is becoming a significant issue. Consequently, the WoS well-reputed journals are giving more space to studies related to these matters, such as children's social media use and consequent impacts, mainly mental and psychological. This further reinforces the gravity and severity of the issue. The worldwide recognized educational institutions and their researchers are contributing to addressing these growing concerns and recommending policymakers devise better policies to reduce and avoid these impacts.

An examination of bibliometric data with the assistance of the visualizations of the possible trends, such as appearances of keywords, authors, and contributions from different countries, gives the overall coverage of the field of study concerning mental health, adolescents, and digital media. This part sums up what we have seen in the different types of graphic representations, frequencies of vocabulary terms, referenced documents most read, country production, and author engagement to represent the core themes, field research expansion, and some of the main drivers that propel the topic forward.

The Country's Production over Time chart in **Figure 6** clearly shows the value of scientific research, with a considerable portion done in China and the USA. Chinese article outputs show an exponential value from 2014 only, showing that the country is shifting its focus to the mental health and digital 5media field. The USA is steadily showing the increase as it notes the growth in research output, which underlines the USA's continued leadership in research.

The "single/multiple country's corresponding authors" graph can be interpreted as the level of geographic contributions to research, with the USA and China leading as single and multiple country publications. The European nations, comprising the UK, Netherlands, and Germany, also contribute immensely to this, the majority at times because of action in international cooperation. This global spread indicates the general acceptance of why people in the digital age should understand mental health.

The visualizations concerning the authors and the nationwide affiliates contributing to the progress of the research show that this research is the result of a collaborative environment. The three-panel plot suggests collaboration among noted authors from different disciplines and regions. As additional varieties, country papers further perpetuate the international movement that works towards understanding and curing mental health issues that are either related to or caused by using digital media.

The word cloud with tree map visualization shows the most common words, such as "mental health," "adolescents," "depression," "children," and "addiction," as the primary terminologies used. This reflects an emphasis on explaining the mental well-being problems experienced by teens while using digital media, which is equally important to Internet use. The spikes chart also reveals a clear tendency, which lies in the number of occurrences of these terms growing dramatically since 2015. This is how we can see that the realization of a problem and increased scientific studies are happening as it concerns the impact of digital environments on mental health. Researchers' interest in psychology is shown through their use of words like "anxiety," "self-esteem," and "behavior," which indicates they are focusing on the psychological effects of digital media on children.

The enhanced usage of words related to inter-media and behavioral health, as denoted by the time-series chart given in **Figure 17** and trending topics visualization as depicted in **Figure 15**, is evidence of increasing concern regarding the complicated interaction of online spaces and the mental health of individuals. Academics are considering different aspects, which include the influence of social media on self-esteem, the frequency of Internet addiction, and the way digital communication has had mental health ramifications among the population.

The fact that children are highlighted means that these age groups are most likely to be negatively affected by such digital forces. The ubiquity of other terms, such as "adolescents," "kids," "self-actualization," and "conduct," in both word clouds and tree maps underscores the importance of understanding that young people are unique with their challenges while navigating the digital environment.

CONCLUSION

The bibliometric graphs and the visualizations present an all-sided portrait of the modern situation in the research area that combines mental health, adolescents, and digital media. The main issue concerns the drastic of mental health and mental disorders in young people, such as adolescents and children, as well as the research work output by leading countries, which is conducted in such countries as the USA and China. Important authors and publications that were much cited create a world around this line of thinking by demonstrating those works that were essential in shaping it. With the increasingly rapid proliferation of digital media, conducting ongoing research will be a fundamental component in developing useful interventions and relevant support systems to promote the psychological well-being of youth. Collaborative teamwork among the sciences and nations will be vital for effectively managing problems that digital media gives rise to, and only a balanced viewpoint can be achieved if such situations are handled comprehensively. The observation done in this research contributed to future research, policy making, and practical applications that dealt with minimizing the negative effects of social media and maximizing its application to positive outcomes.

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Data availability: Data generated or analyzed during this study are available from the authors on request.

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