



A bibliometric analysis of research on the psychological and social implications of digital technology use on children and young people's well-being in online environments

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ABSTRACT

The widespread adoption of digital technologies has profoundly influenced the lives of children, youths, and adolescents, raising growing concerns about the psychological and social impacts of online engagement. In response, this study presents a comprehensive bibliometric analysis of the research landscape in this field, highlighting publication trends, key contributors, emerging research themes, and patterns of collaboration. Using data retrieved from the Scopus database, the analysis examined publication growth, identified the most influential authors, journals, and countries, explored co-authorship relationships among authors and nations, and assessed knowledge exchange through bibliographic coupling of countries. The results indicate a steady increase in publication output over the past decade, with a pronounced surge in recent years, reflecting heightened scholarly interest in this area. Several authors, institutions, and countries emerged as major contributors to the literature. Keyword co-occurrence analysis revealed prominent research themes, including cyberbullying, internet addiction, social media use, and their implications for mental health. In addition, the study examined collaboration patterns among researchers and journals and identified clusters of countries with strong collaborative ties. Overall, these findings provide valuable insights into the current state of research on the psychological and social effects of digital technology use on children's and adolescents' well-being in online environments, highlighting research gaps, collaboration opportunities, and future research directions. The bibliometric approach employed offers a distinctive perspective on the evolving knowledge landscape and supports efforts to strengthen collaboration and enhance research impact in this critical field.

Keywords: digital technologies, psychological implications, online environments, bibliometric analysis, mental health, digital technology use

INTRODUCTION

The rise of digital technologies has transformed the lives of children and young people in modern times. They use tech devices like smartphones, tablets, and social media networks to communicate, do business, and remain well-informed due to the rapid proliferation of widely available information (Evans, 2021). While these technologies are good at providing various opportunities for communication, learning, and entertainment, there are certain growing concerns about the psychological and social risks they pose to the well-being of this vulnerable population (Brony et al., 2024a; Chassiakos et al., 2016; Odgers & Jensen, 2020). Recent studies show that children and young people spend increasing amounts of time in social media online environments (Bozzola et al., 2022); it is noteworthy to learn the impact of digital technology use on their psychological wellbeing, social empowerment, and overall wellbeing.

Numerous studies have explored the psychological and social implications of digital technology use on children and young people, such as the potential risks of excessive screen time, increased sedentary behavior, sleep disturbances, and impaired academic performance (Fanxing et al., 2023; Pellerine et al., 2023; Stiglic & Viner, 2019; Twenge & Campbell, 2018). Additionally, concerns have been raised about the impact of online content and activities on children's cognitive development, attention span, and information processing skills (Chassiakos et al., 2016; Orben, 2020; Radesky et al., 2020; Vedeckina & Borgonovi, 2021). For instance, a systematic review by Orben (2020) examined the relationship between adolescents' digital technology engagement and well-being outcomes, finding small negative associations with psychological well-being and no associations with social well-being. Similarly, Vedeckina and Borgonovi (2021) found that the impact of digital technologies on children's attention and cognitive control varies significantly based on individual user characteristics, the type of technology, and the context of its use, with considerable variability in outcomes. However, other researchers have highlighted the potential risks of excessive screen time, such as increased sedentary behavior, sleep disorders, stress, anxiety, obesity, and depression (Brony et al., 2024b; Nakshine et al., 2022; Stiglic & Viner, 2019; Twenge & Campbell, 2018).

In the realm of social implications, the use of social media and online communication platforms has been linked to both positive and negative effects on peer relationships, social connectedness, and cyberbullying (Beyens et al., 2020; Nesi et al., 2018). Recent research further indicates that the impacts of these digital interactions are highly context-dependent, shaped by platform affordances, intensity of use, and individual vulnerabilities, which can amplify both supportive peer engagement and exposure to online harassment (Odgers & Jensen, 2020; Valkenburg et al., 2022). Given the rapidly evolving digital landscape and the growing body of research in this area, it is crucial to systematically examine the literature and identify emerging trends, influential contributors, and research hotspots. Bibliometric analysis offers a valuable approach to map the intellectual structure of a research field, providing insights into publication patterns, collaborative networks, and conceptual relationships (Ellegaard & Wallin, 2015; Jiaqing et al., 2023; Sikandar et al., 2021a, 2023).

The rapid pace of technological advancements and the ever-evolving digital landscape have made it challenging for researchers, policymakers, and practitioners to keep up with the potential implications of digital technology use on children and young people's well-being. As new technologies and platforms emerge, new research questions and challenges arise, necessitating continuous investigation and analysis. Given the rapidly evolving digital landscape and the growing body of research on the psychological and social implications of digital technology use on children and young people's well-being in online environments, this study aims to provide a comprehensive bibliometric analysis to address the following research questions:

1. What are the publication trends and growth patterns in this research area, and which authors, institutions, and countries have made the most significant contributions to the literature?
2. What are the most influential and highly cited publications in the field, and which journals have published the most articles on this topic?

3. What are the prominent research themes and concepts that have emerged, as reflected by the keyword co-occurrence analysis, and how have the research collaborations and co-authorship patterns evolved among authors and countries?
4. What are the collaboration patterns and knowledge exchange among different countries, as identified through bibliographic coupling analysis, and are there distinct clusters or groups of countries with stronger research collaborations?

By systematically examining the literature through bibliometric analysis, this study aims to map the intellectual structure of the research field, providing insights into publication patterns, collaborative networks, conceptual relationships, and the diffusion of knowledge across disciplines. Addressing these research questions will contribute to a better understanding of the current state of research, identify potential research gaps, and inform future directions in this critical area of inquiry.

LITERATURE REVIEW

Researchers have spent a lot of time over the past few years trying to understand how digital technologies affect the well-being of children and young people. Much of this work looks closely at mental health, asking whether and how screen use shapes emotions, behavior, and overall psychological health.

One major review by Odgers and Jensen (2020) shows that the relationship between technological use and well-being is not simple. While heavy screen time and frequent social media use are often linked to higher levels of anxiety and depression, the authors point out that these effects depend on who the young person is and the context of their life. In other words, technology does not affect everyone in the same way.

Similar concerns appear in a longitudinal study by Twenge et al. (2018), which followed adolescents in the United States over time. The study found that higher use of digital media, especially smartphones and social media, was associated with greater psychological distress, increased depression, and higher levels of suicidal thoughts. These findings raised questions about how much digital media is too much, particularly during adolescence.

Beyond mental health, researchers have also examined how digital technologies shape social experiences. Studies show that social media can help young people stay connected and communicate with peers, but there is a downside. Nesi et al. (2018) found that excessive social media use was linked to more peer conflict and a higher risk of cyberbullying.

Cyberbullying has become one of the most serious concerns in the digital age. A systematic review by Dharejo et al. (2023) reported that young people who experience cyberbullying are more likely to struggle with depression, anxiety, and suicidal thoughts. Other research, such as the study by Beyens et al. (2020), shows that being targeted online can also harm self-esteem, reduce life satisfaction, and negatively affect school performance. Together, these findings highlight the urgent need for effective prevention and intervention efforts.

Researchers have also explored how digital technology affects learning and cognitive development. Radesky et al. (2020) found that excessive exposure to digital media may interfere with attention, learning, and self-control in children and adolescents. Supporting this, Stiglic and Viner (2019) reported that high levels of screen time were linked to poorer academic performance and weaker cognitive skills, particularly in areas related to concentration and executive functioning.

Although this growing body of research has deepened our understanding of the psychological, social, and cognitive effects of digital technology, the field continues to evolve rapidly. New platforms and technologies appear constantly, and the volume of research keeps increasing. Because of this, a comprehensive overview of the literature is needed. Bibliometric analysis offers a useful way to map research trends, identify influential studies and authors, explore collaboration patterns, and highlight emerging themes (Salam et al., 2021; Sikandar et al., 2022, 2023; Vaicondam et al., 2022). By systematically analyzing the existing literature, researchers can better understand what is already known, identify gaps in knowledge, and guide future research in this important area.

Recent research highlights that the relationship between digital technology use and youth well-being is complex and context-dependent. Rather than screen time alone, outcomes depend on the type of activity,

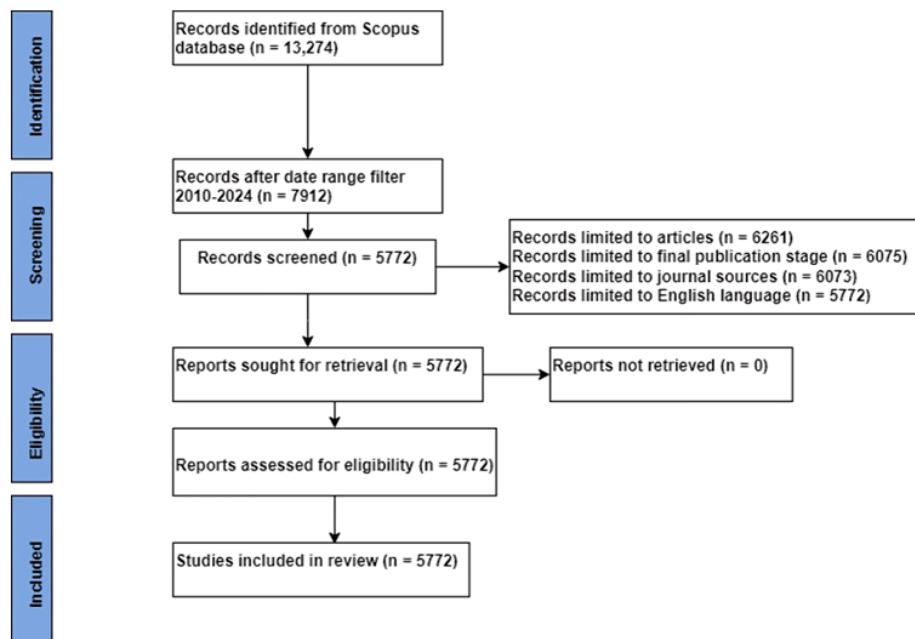


Figure 1. PRISMA statement 2020 for inclusion and exclusion of records [Adapted from Page et al. (2021)]

individual traits, and social context (Granic et al., 2020). Studies increasingly distinguish between problematic use—which predicts worsened mental health—and general screen exposure, which often shows weak or bidirectional associations with anxiety or depression (Li & Batterham, 2025; Xu et al., 2025). Post-pandemic analyses show shifts toward greater online communication and learning, with emotional effects varying by context and motivation (Nagata et al., 2021). Longitudinal and experimental studies further suggest that reducing leisure screen time can improve well-being, but effects are modest and individualized (Rodman et al., 2024; Schmidt-Persson et al., 2024)

METHODOLOGY

Data Source and Search Strategy

Adhering to the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines (Moher et al., 2009; Page et al., 2021), a bibliometric analysis was conducted using the data retrieved from the Scopus database. The Scopus database is known for its high-quality papers, incredible indexing, and advanced search capabilities and services. It is ideal for conducting a bibliometric analysis (Khan et al., 2023; Sikandar et al., 2021b, 2021c; Vaicondam et al., 2022). The following search string was used to perform the search for studies:

TITLE-ABS-KEY (“digital technology” OR “online environment” OR “internet” OR “social media” OR “screen time”) AND (child* OR adolescen* OR youth OR “young people”) AND (“well-being” OR “mental health” OR “psychological implic*” OR “social implic*” OR “cognitive development” OR “peer relation*” OR “social connect*” OR cyberbullying OR “internet addiction”) AND PUBYEAR > 2019 AND PUBYEAR < 2025 AND (LIMIT-TO (DOCTYPE, “ar”)) AND (LIMIT-TO (PUBSTAGE, “final”)) AND (LIMIT-TO (SRCTYPE, “j”)) AND (LIMIT-TO (LANGUAGE, “English”)).

The search string captures relevant studies for the review published within the timeframe from 2019 to 2024, and the main focus was on the psychological and social implications of digital technology use on children and young people.

The selection process followed the PRISMA 2020 guidelines to ensure transparency and reproducibility (Page et al., 2021). Initially, 13,274 articles were retrieved in the search. After applying the filter from 2019 to 2025, the studies were reduced to 7,912 articles. The document type filter reduced the number of studies to 6,261 articles. The final publication stage and journal source filter resulted in 6,037 studies. Finally, the English language filter brought 5,772 articles (see [Figure 1](#)).

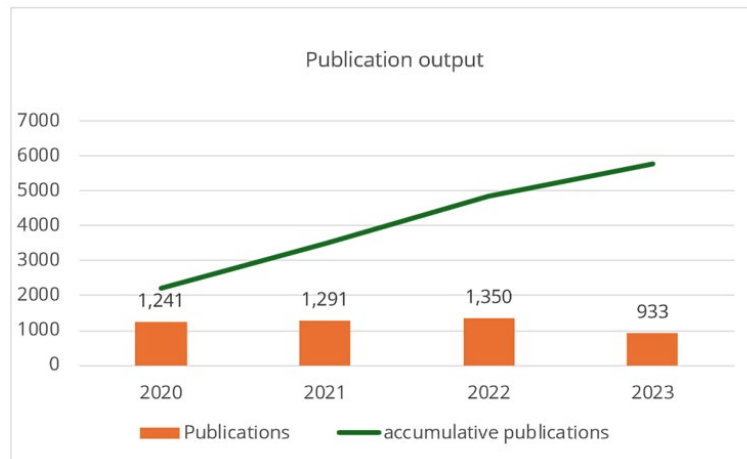


Figure 2. Publication trend (Generated by the authors using the Bibliometrix R package)

Data Selection and Analysis

The final dataset was evaluated for its relevance to the key aspects of the research topic, ensuring that only those studies were added. The final dataset that met the qualification was 5,772 studies. The relevant data for the review, such as authorship, journal, publication year, and citation details, were extracted for analysis. The extracted data were then utilized using bibliometric tools to show patterns, trends, and key research areas in the topic under review. The findings provide insights into the emerging body of knowledge on digital technology and its impact on youngsters' wellbeing.

RESULTS

Publication Trends and Growth Patterns

Our examination of the data indicates a steady increase in research output. **Figure 2** shows that the number of publications each year has been steadily rising from 2020 to 2023, reaching a high of 1,350 in 2023. The total number of publications is going up, from 957 in 2020 to 4,839 by the end of 2023. The data for 2024 is still not complete, with only 933 publications so far, but the total number of publications has already reached 5,772. This shows that research on this topic is still going up.

Most Influential Authors

Table 1 reflects the distribution of research productivity and scholarly influence among the most prominent authors in the field of digital children's mental well-being. The data show that M. D. Griffiths from Nottingham Trent University emerges as the leading contributor, with 35 publications and the highest h-index (129), indicating both sustained output and strong citation impact. M. N. Potenza from Yale School of Medicine follows, recording 27 publications and an h-index of 107, further reinforcing his influence within the field. J. M. Nagata from the UCSF School of Medicine demonstrates comparable productivity with 26 publications, though with a lower h-index of 35, suggesting more recent or narrower citation reach. Additional contributors, including K. T. Ganson and M. Alvarez-Jimenez, also display notable publication activity, with 24 and 20 publications, respectively. Overall, the distribution presented in **Table 1** highlights a concentration of influence among a small group of researchers whose publication volume and citation metrics have played a central role in shaping current research directions.

Most Influential Journals

Table 2 lists the top five most influential journals in the reviewed studies. International Journal of Environmental Research and Public Health leads in publication output with 470 publications and 6936 citations. The heavily cited document (1,202 citations) is on the psychological impacts of COVID-19. The second most influential journal is PLoS ONE with 176 publications and 5,227 citations, featuring a highly cited article on mental health, social media during COVID-19, with 1,755 citations. Frontiers in Psychiatry and BMJ Open

Table 1. Most influential authors

Name	TP	Affiliation	Scopus ID	h-index
Griffiths, M. D.	35	Nottingham Trent University, United Kingdom	7201549643	129
Potenza, M. N.	27	Yale School of Medicine, United States	7006591634	107
Nagata, J. M.	26	UCSF School of Medicine, United States	26323728300	35
Ganson, K. T.	24	University of Toronto, Canada	57205201494	19
Alvarez-Jimenez, M.	20	Centre for Youth Mental Health, Australia	18633757300	47
Baker, F. C.	20	University of the Witwatersrand, Johannesburg, South Africa	7202513769	51
Hallit, S. R.	19	Holy Spirit University of Kaslik, Lebanon	37101759800	34
Lin, C. Y.	17	National Cheng Kung University College of MedicineTaiwan	37124450500	57
Chaput, J. P.	16	University of Ottawa, Canada	8959986900	79
Testa, A. M.	16	University of Texas Health Science Center at Houston, United States	57191416797	21

Note. TP: Total publications

Table 2. Most Influential journals

Source	TP	TC	CS	Title of the most cited document	TCd	Publisher
International Journal of Environmental Research and Public Health	470	6,936	7.3	The impact of COVID-19 epidemic declaration on psychological consequences: A study on active Weibo users	1,202	Multidisciplinary Digital Publishing Institute
PLoS ONE	176	5,227	6.2	Mental health problems and social media exposure during COVID-19 outbreak	1,755	Public Library of Science
Frontiers In Psychiatry	124	1,302	6.2	Internet addiction and related psychological factors among children and adolescents in China during the coronavirus disease 2019 (COVID-19) epidemic	254	Frontiers Media S.A.
BMJ Open	107	911	4.4	Mental health in the UK during the COVID-19 pandemic: Cross-sectional analyses from a community cohort study	234	BMJ Publishing Group
Journal of Medical Internet Research	107	2,002	14.4	The impact of social media on panic during the COVID-19 pandemic in Iraqi Kurdistan: Online questionnaire study	437	JMIR Publications Inc.

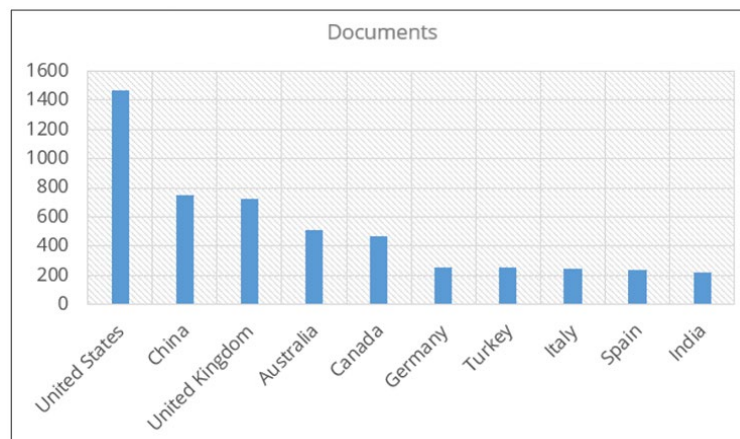


Figure 3. Most productive countries (Generated by the authors using the Bibliometrix R package)

also show remarkable contributions reflecting their roles in disseminating mental health research, with BMJ Open emphasizing large-scale studies conducted in the United Kingdom during the COVID-19 period. The Journal of Medical Internet Research stands out with a high citation score of 14.4, focusing on the impact of social media on panic during the pandemic in Iraqi Kurdistan, cited 437 times. Overall, the results indicate that journal influence in this field is shaped not only by publication volume but also by citation concentration and topical relevance, particularly in relation to pandemic-focused research.

Top Influential Countries

In examining the productivity of countries in digital technology's impact on children and young people's wellbeing, data from **Figure 3** reveal that the United States leads with 1,400 documents, followed by China with around 900 documents.

Table 3. Top keywords based on the TLS

Keyword	Links	TLS	Occurrences
Adolescents	547	4,372	1,362
Mental health	475	3,402	971
COVID-19	421	2,609	863
Internet addiction	371	2,176	880
Social media	390	2,136	665
Depression	368	2,054	580
Youth	361	1,681	444
Anxiety	279	1,414	372
Children	309	1,264	374
Internet	291	1,021	283
Well-being	247	1,007	304
Screen time	203	921	261
Digital health	237	917	241
Cyberbullying	229	909	338
Students	204	690	216
Stress	180	654	183
Physical activity	147	650	185
Parenting	200	635	186
Smartphones	183	578	143
Addiction	164	505	165

The network visualization map further illustrates the interconnections and clustering of related keywords, providing insights into the conceptual relationships and potential overlaps between different research themes. It is important to note that the co-occurrence of keywords analysis provides an overview of the prominent research themes and concepts based on the frequency and co-occurrence of keywords.

Overall, the analysis section effectively combines the quantitative data from [Table 2](#) and the visual representation from the network visualization map, offering a comprehensive understanding of the prominent research themes and their interconnections within the field of study. Top keywords based on the TLS are mentioned in [Table 3](#).

Collaboration and Co-Authorship Patterns

To investigate the collaborative dynamics and co-authorship patterns within the research area, we conducted analyses focusing on the co-authorship networks of authors and countries. By examining these networks, we aimed to identify influential researchers and international collaborations. The co-authorship analyses provided insights into the interconnectivity, density, and clustering of authors and countries, revealing collaboration patterns, interdisciplinary linkages, and research hotspots (Sikandar & Abdul Kohar, 2022). These findings shed light on the collaborative landscape, highlighting opportunities for fostering collaborations, knowledge sharing, and enhancing research impact.

Co-authorship of authors

The co-authorship analysis presented in this section aims to identify the most influential and collaborative authors in the research area under study. The analysis was conducted using VOSviewer ([Figure 5](#)). To ensure a focused analysis, the study set a minimum threshold of five documents per author and five citations. This filtering criterion resulted in the inclusion of 290 authors out of the initial 25,382 authors in the dataset.

Our analysis ([Table 4](#)) identified the most influential and collaborative authors in the research area. The co-authorship analysis in this bibliometric study ranks authors based on their TLS, which reflects the intensity and frequency of their collaborations with other researchers in the field (van Eck & Waltman, 2017, 2020). At the top of the rankings is J. M. Nagata from UCSF School of Medicine, with an impressive TLS of 116, indicating his extensive involvement in collaborative research projects and strong, recurring partnerships with multiple co-authors. Closely following J. M. Nagata is K. T. Ganson from the University of Toronto, with a TLS of 113, suggesting an equally significant level of collaborative engagement and a dedication to fostering collaborative research efforts.

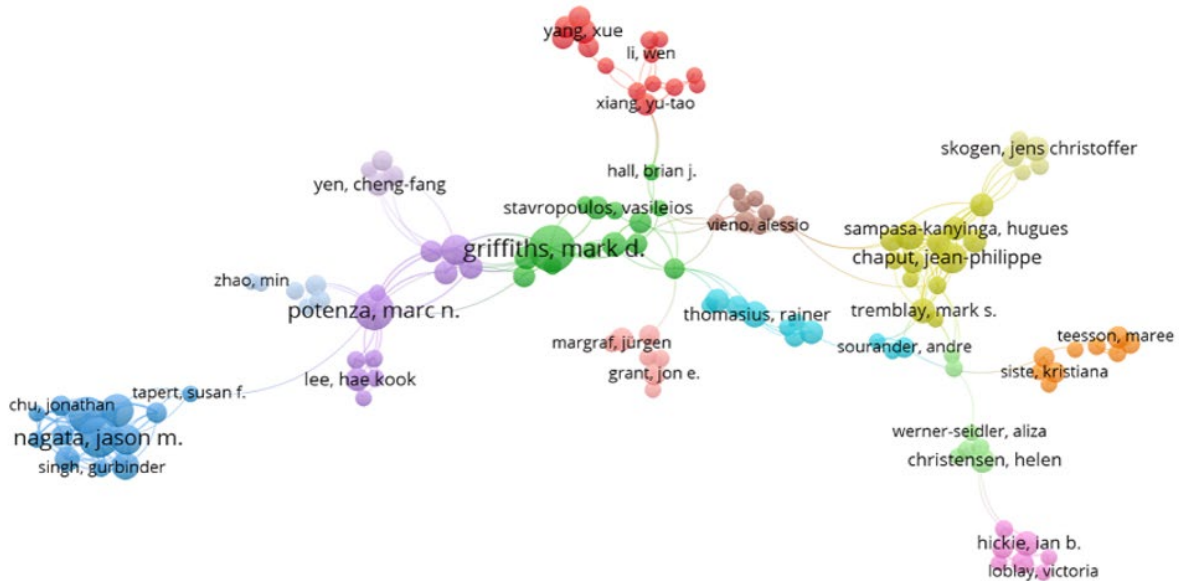


Figure 5. Co-authorship analysis of authors (Generated by the authors using the Bibliometrix R package)

Table 4. Top collaborating authors based on the TLS

Authors	Links	TLS	Documents	Citations
Nagata, J. M.	12	116	26	432
Ganson, K. T.	11	113	24	208
Baker, F. C.	12	91	18	274
Testa, A.	10	74	16	85
Murray, S. B.	10	65	11	158
Jackson, D. B.	9	60	13	86
Griffiths, M. D.	13	51	37	1,458
Chaput, J.-P.	11	47	16	225
Bibbins-Domingo, K.	10	45	7	130
Colman, I.	13	44	9	94
Potenza, M. N.	16	44	27	639
Chu, J.	9	43	7	118
Lin, C.-Y.	8	41	16	835
Sampasa-Kanyinga, H.	8	38	10	122
Singh, G.	8	36	6	54
Leatherdale, S. T.	12	34	14	118
Goldfield, G. S.	10	33	10	132
Garber, A. K.	8	31	5	103
Iyer, P.	7	31	5	106
Chen, I-H.	5	28	10	589

F. C. Baker from the University of the Witwatersrand, Johannesburg, secures the third position with a TLS of 91, reflecting her active participation in collaborative research projects and the establishment of strong working relationships with various co-authors within the research area. A. Testa from the University of Texas Health Science Center at Houston, with a TLS of 74, and S. B. Murray, with a TLS of 65, also demonstrate substantial levels of collaboration, contributing to the overall research landscape through their frequent collaborations with multiple research partners.

The ranking based on TLS highlights the authors who have been most actively involved in collaborative research efforts and have formed strong partnerships with various co-authors. A high TLS value signifies an author's ability to establish and maintain productive collaborations, which can lead to more diverse perspectives, shared expertise, and potentially more impactful research outcomes. However, it is crucial to consider TLS alongside other metrics, such as the number of publications, citations, and research impact, to gain a comprehensive understanding of an author's overall contributions to the research area.

It's important to note that while TLS provides insights into the intensity of collaborations, it should be considered alongside other metrics, such as the number of publications, citations, and research impact, to

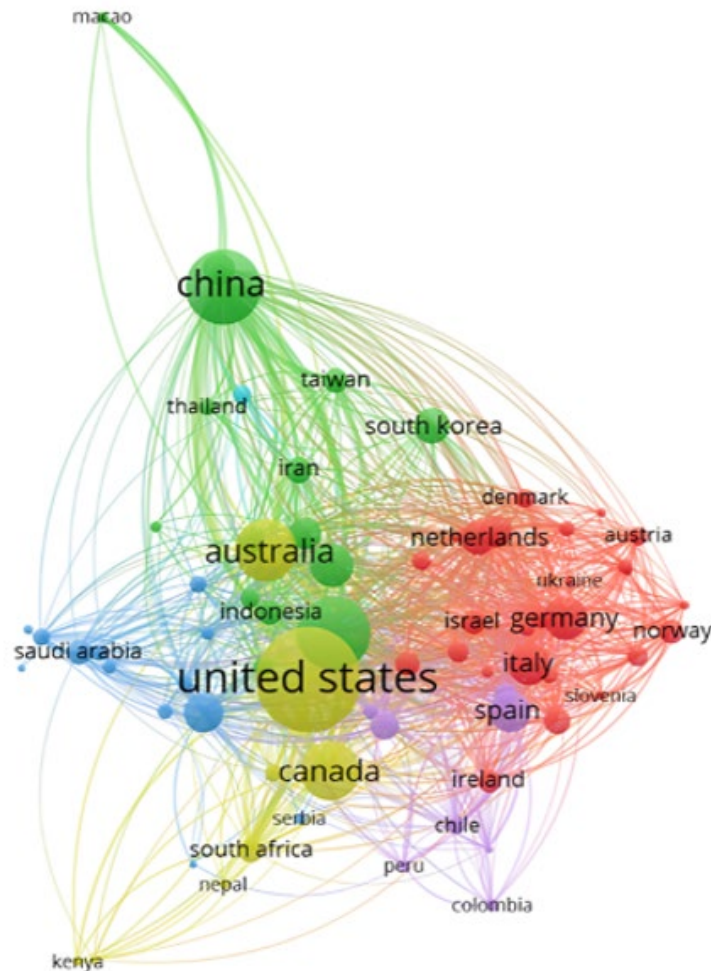


Figure 6. Co-authorship analysis of countries (Generated by the authors using VOSviewer)

gain a comprehensive understanding of an author's overall contributions to the research area. Overall, this co-authorship analysis provides valuable insights into the research landscape, identifying the most prolific and influential authors, as well as those actively engaged in collaborative research efforts. By combining information on publications, citations, and co-authorship patterns, this analysis presents a comprehensive picture of the key players and their roles within the research area under study.

Co-authorship of countries

The co-authorship analysis of countries provides valuable insights into the international collaboration patterns and research dynamics within the field under investigation. In this section, the analysis was conducted by setting a minimum threshold of 10 documents per country and 10 citations, resulting in the inclusion of 71 countries out of the initial 240 countries in the dataset.

Figure 6 presents a network visualization of international research collaborations, with nodes representing countries and links indicating co-authorship connections. The United States emerges as the central and largest node, signifying its prominent role as a major research hub with extensive global collaborations. Notable nodes include the United Kingdom, China, Australia, Canada, and Germany, suggesting their active involvement in international partnerships. Regional clusters are visible, such as European and Asian countries, reflecting stronger intra-regional collaborations. Some countries appear more isolated or have fewer connections, indicating potential opportunities for fostering new collaborations. Overall, this visualization offers insights into the global collaboration landscape, research hubs, and prospects for enhancing international research partnerships.

Table 5. Top collaborating countries based on the TLS

Country	Links	TLS	Documents	Citations
United States	65	1,138	1,453	25,442
United Kingdom	68	854	713	12,293
Australia	63	556	504	7,134
China	52	507	747	15,858
Canada	55	460	461	9,024
Germany	56	374	253	4,048
Italy	54	312	240	4,777
Spain	55	301	234	3,240
Sweden	53	294	147	2,622
Netherlands	54	283	152	3,040
Hong Kong	42	212	135	2,446
South Africa	51	194	83	923
India	56	191	216	3,388
Switzerland	40	188	95	1,124
Brazil	49	185	106	1,295
France	44	159	84	1,574
Taiwan	42	154	83	1,564
Belgium	48	142	60	1,363
Israel	41	142	78	1,745
Norway	36	135	85	1,009

Table 5 displays various metrics for each country, including the number of links, TLS, documents, and citations. These metrics offer a comprehensive understanding of the collaborative relationships and research contributions of different countries.

At the top of **Table 5**, we can observe countries such as the United States, United Kingdom, Australia, China, and Canada, which have a high number of links, TLS, documents, and citations. These countries can be considered research hubs or hotspots within the field, as they have established strong international collaborations and have made significant research contributions, as evidenced by their substantial publication output and citation counts.

For instance, the United States stands out with 1,453 documents, 25,442 citations, and a TLS of 1,138, indicating its central role in fostering international collaborations and its influential position in the research area. Similarly, the United Kingdom, Australia, China, and Canada exhibit robust international collaborative networks and substantial research productivity, as reflected in their respective metrics.

On the other hand, **Table 5** also includes countries with relatively lower TLS values, such as Iraq, Qatar, Ethiopia, Serbia, and Nepal. These countries may have fewer international collaborations within the specific research area, potentially due to factors such as limited research infrastructure, funding constraints, or geographic isolation. However, it is essential to note that a lower TLS does not necessarily imply a lack of research contributions; these countries may still have made valuable contributions through their publication output and citations. The analysis also highlights countries like Vietnam, which has a relatively high number of citations (2,244) but a lower TLS (48), suggesting potential opportunities for fostering international collaborations and knowledge exchange. Similarly, countries like New Zealand, Tunisia, Macao, and Peru demonstrate varying levels of research productivity and international collaborations, reflecting the diverse research landscapes across different regions.

By examining the co-authorship patterns of countries, this analysis provides insights into the global research landscape, identifying research hubs, potential knowledge exchange opportunities, and areas where international collaborations can be strengthened (**Table 6**). These findings can inform strategies for fostering international partnerships, leveraging complementary research strengths, and enhancing the overall impact of research efforts within the field.

Bibliographic Coupling

A bibliographic coupling of countries represents the strength of research collaboration between them. Bibliographic coupling was done to identify intellectual bases and knowledge domains. Minimum citations are set to 20 documents per country and 20 citations. 56 countries met the threshold out of 240.

Table 6. Bibliographic coupling of countries

Country	Links	TLS	Documents	Citations
Iraq	5	6	11	568
Qatar	6	7	12	74
Ethiopia	6	9	11	106
Serbia	9	12	18	100
Nepal	13	20	13	34
Philippines	11	20	17	259
Ukraine	17	21	21	225
Ghana	10	22	10	56
Lithuania	16	23	14	106
Slovakia	13	25	15	367
Croatia	24	29	21	317
Kenya	11	29	14	125
Colombia	13	32	23	115
Cyprus	28	42	15	173
Argentina	24	43	11	61
New Zealand	22	43	47	558
Tunisia	19	44	24	89
Macao	9	45	21	356
Viet Nam	29	48	33	2,244
Peru	28	50	19	135

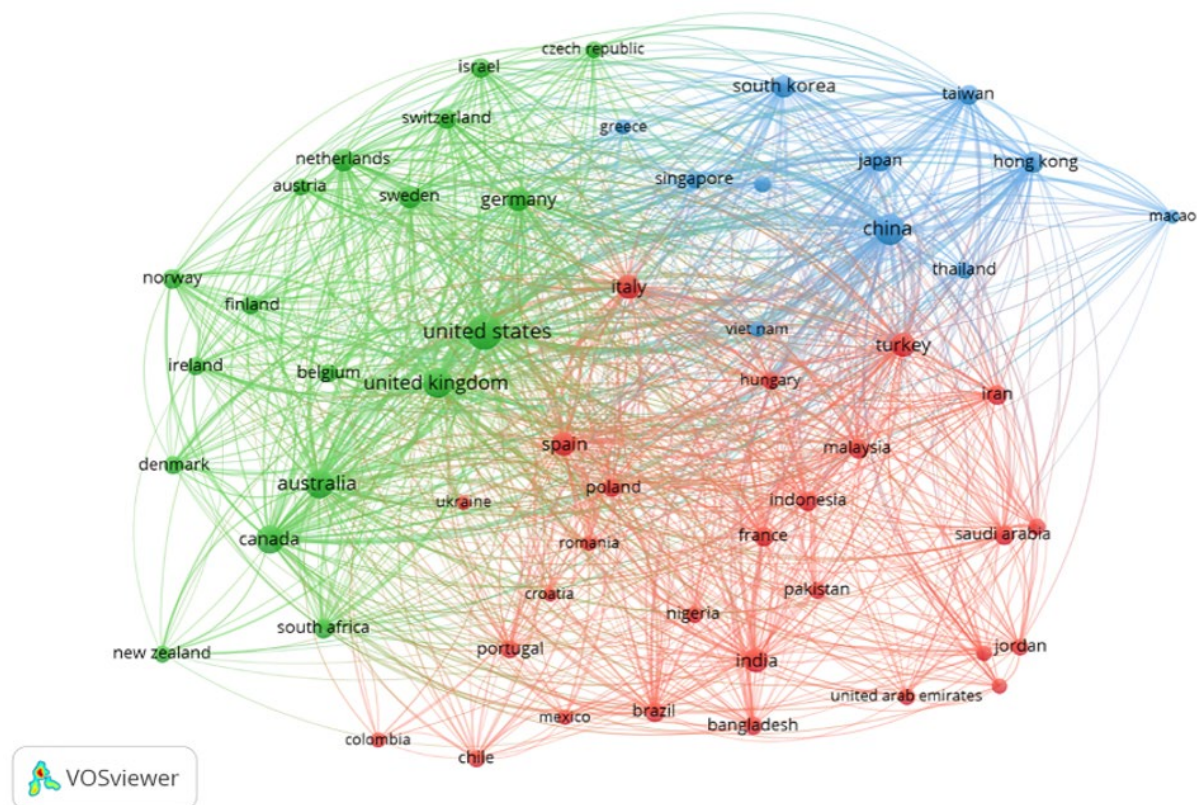


Figure 7. Bibliographic coupling of countries (Generated by the authors using VOSviewer)

The network visualization map (Figure 7) provides valuable insights into the international collaboration patterns and clustering of countries within the research area under study. The map displays nodes representing different countries, with the connections (links) between them indicating collaborations between researchers from those countries. The colors assigned to the nodes and links correspond to distinct clusters, as identified in the data file.

Table 7. Top countries doing collaborative research

Country 1	Country 2	Links between Country 1 and Country 2
China	United States	64,955
United Kingdom	United States	59,994
Canada	United States	41,006
Australia	United States	38,449
China	United Kingdom	38,050
Australia	United Kingdom	30,307
China	Hong Kong	21,742
Australia	China	21,455
Canada	United Kingdom	21,187
Germany	United States	21,105
Italy	United States	20,350
China	Turkey	20,246
Canada	China	19,831
China	Italy	18,741
Spain	United States	17,134
Australia	Canada	16,498
China	Germany	16,098
Turkey	United States	16,046
Italy	United Kingdom	15,293
Netherlands	United States	15,278

The bibliographic coupling visualization reveals distinct patterns of global research collaboration in this field. The bibliographic coupling analysis identified three distinct clusters, each representing different regional research networks and patterns of collaboration within the field:

1. **Cluster 1 (red cluster):** This cluster includes countries primarily from the Middle East, South Asia, and parts of Europe. Key countries in this cluster are Italy, Spain, Turkey, India, Iran, Brazil, and Malaysia. These countries exhibit strong intra-regional collaboration, particularly among Middle Eastern and South Asian nations, but also serve as connectors to other regions, particularly Europe. Italy and Spain are notable for their intermediary roles, bridging European and Asian research networks. Additionally, countries like Brazil, Jordan, and Saudi Arabia are central within this cluster but have less connection to Western countries.
2. **Cluster 2 (green cluster):** This is the largest cluster and includes predominantly Western nations such as the United States, United Kingdom, Australia, Germany, Canada, and the Netherlands. The United States is the central hub in this cluster, reflecting its dominant role in global research collaborations. The United Kingdom and Germany also feature prominently, indicating strong collaboration between Western European nations and North America. This cluster is marked by extensive intra-regional collaboration, with countries like Australia and Canada also playing significant roles in bridging collaborations with other global regions. Smaller Western European countries such as Sweden, Norway, and Ireland are strongly connected within this network as well.
3. **Cluster 3 (blue cluster):** This cluster is dominated by East Asian countries, with China, Japan, South Korea, Hong Kong, and Taiwan being the central players. China serves as the major hub, reflecting its rapidly growing influence in global research, particularly within East Asia. Japan and South Korea are closely connected to China and also exhibit strong collaboration with each other and the broader East Asian region. This cluster reflects the strength of regional cooperation within East Asia, with Singapore and Russia also contributing to the collaboration network.

Table 7 highlights that the United States stands out as the primary hub of global research collaboration, exhibiting strong connections to almost all countries across different clusters, suggesting its central role in the global research landscape. China and the United States have the highest number of shared references (64955), indicating a strong research collaboration between the two countries. China, the United Kingdom, and Germany also appear as major players, as indicated by their large node sizes and extensive links. Distinct regional collaboration patterns are evident, particularly within Western nations (cluster 2) and East Asian nations (cluster 3), where countries collaborate closely within their respective regions. Italy and Spain in cluster 1 serve as significant bridging nations, connecting various regional clusters. Peripheral countries such

as Jordan, Chile, and Nigeria appear on the outskirts of the network, suggesting fewer collaborative ties or lower research output within the global research community in this field.

CONCLUSION

This bibliometric analysis provides a comprehensive overview of the rapidly evolving research landscape focused on the psychological and social implications of digital technology use on children and young people's well-being in online environments. The steady growth in publications over the past decade, culminating in a notable surge in recent years, reflects the increasing research interest and societal concerns surrounding this critical issue.

Influential authors, such as M. D. Griffiths, M. N. Potenza, and J. M. Nagata, along with prestigious institutions like Nottingham Trent University, Yale School of Medicine, and UCSF School of Medicine, have significantly contributed to shaping the discourse and advancing knowledge in this field. While major research hubs exist in North America, Europe, and certain Asian countries, fostering broader international collaborations is crucial for capturing diverse perspectives and addressing the nuances of digital technology's impact across different cultural and societal contexts.

The analysis of highly cited publications and prominent journals, such as the *International Journal of Environmental Research and Public Health*, *PLoS ONE*, and *Frontiers in Psychiatry*, sheds light on the seminal works and groundbreaking research that have shaped the field, as well as the influential platforms for knowledge dissemination. The keyword co-occurrence analysis highlighted prevailing themes like cyberbullying, internet addiction, social media use, and mental health implications, underscoring the need for targeted interventions, educational initiatives, and policy frameworks to address these challenges effectively.

The examination of co-authorship patterns among authors and countries revealed the formation of collaborative networks, research communities, and regional clusters, indicating the presence of knowledge exchange and potential synergies among researchers with shared interests or methodological approaches. However, opportunities exist for fostering new collaborations among countries or regions with fewer collaborative ties, leveraging diverse expertise and resources to tackle complex challenges more comprehensively.

While the bibliometric analysis has provided valuable insights, it is essential to acknowledge its limitations, such as the scope of the database used (Scopus) and the time period covered. Future studies could complement this quantitative approach with qualitative methods, such as content analysis or expert interviews, to gain a deeper understanding of the research dynamics, motivations, and contextual factors shaping the field.

As digital technologies continue to evolve rapidly, and their impact on children and young people's well-being becomes increasingly complex, continuous monitoring and analysis of the evolving research landscape will be crucial. Conducting periodic bibliometric studies, incorporating additional data sources or analytical techniques, and adapting to emerging research trends will be essential to maintain a comprehensive understanding of this critical area of inquiry.

Interdisciplinary collaborations across fields like psychology, social sciences, education, public health, and computer science could provide innovative approaches and diverse perspectives to address the multifaceted challenges associated with digital technology's impact on children and young people's well-being. By fostering such collaborations and leveraging the collective expertise of various disciplines, researchers can develop holistic solutions and contribute to the overall well-being of children and young people in the digital age.

In conclusion, this bibliometric study contributes to a better understanding of the current state of research on the psychological and social implications of digital technology use on children and young people's well-being in online environments. By interpreting publication trends, influential contributors, prominent research themes, collaboration patterns, and knowledge exchange dynamics, the study provides valuable insights to inform future research endeavors, foster collaborations, and ultimately contribute to the well-being of children and young people navigating the digital landscape.

Limitations of the Study

Although this bibliometric study offers valuable insights into the research landscape related to the psychological and social implications of digital technology use on children and young people's well-being in online environments, it is essential to acknowledge certain limitations. The study's scope is confined to the Scopus database, potentially excluding relevant literature from other sources or published during different time periods. Additionally, the inherent reliance on quantitative metrics and patterns in bibliometric analyses may not fully capture the nuances, contextual factors, and underlying motivations driving research efforts in this field. The analysis is also influenced by the search strategy employed, metadata quality, and the specific bibliometric indicators considered, potentially introducing biases or overlooking other aspects of research impact or influence.

Directions for Future Research

As digital technologies continue to evolve rapidly, and their impact on children and young people's well-being becomes increasingly complex, continuous monitoring and analysis of the evolving research landscape will be crucial. Conducting periodic bibliometric studies, incorporating additional data sources or analytical techniques, and adapting to emerging research trends will be essential to maintain a comprehensive understanding of this critical area of inquiry. Complementing the quantitative bibliometric approach with qualitative methods, such as content analysis, expert interviews, or case studies, could offer a more nuanced understanding of the research dynamics and contextual factors shaping this field. Fostering interdisciplinary collaborations across fields like psychology, social sciences, education, public health, and computer science could provide innovative approaches and diverse perspectives to address the multifaceted challenges associated with digital technology's impact on children and young people's well-being.

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