



RESEARCH ARTICLE / ARAŞTIRMA MAKALESİ

# Post-Pandemic Healthcare Workers: A Comprehensive Bibliometric Evaluation of Psychosocial Impacts and Health Management Strategies

## Pandemi Sonrası Sağlık Çalışanları: Psikososyal Etkiler ve Sağlık Yönetimi Stratejilerinin Kapsamlı Bir Bibliyometrik Değerlendirmesi

Melek Yağcı Özen<sup>1</sup>

### Abstract:

This study aimed to evaluate the psychosocial impacts of the COVID-19 pandemic on healthcare workers and the reflections on these impacts within the field of health management, using a bibliometric analysis. To this end, a systematic search was conducted in the Web of Science database using the keywords “COVID-19,” “healthcare workers,” “psychosocial effects,” and “health management.” Research articles published after 2019, written in English, and indexed in SCI, SSCI, A&HCI, ESCI, and SCI-Expanded were included in the analysis. Within the scope of the bibliometric analysis, keyword co-occurrence networks, co-authorship collaboration patterns, and the contributions of leading institutions and countries to the field were examined. A total of 6,341 articles were analyzed. The findings indicate a substantial increase in research attention after 2021, particularly regarding mental health, burnout, stress, and workload among healthcare workers. The most frequently used keywords were “mental health,” “burnout,” and “psychological distress.” Additionally, a notable rise in international and interdisciplinary collaborations was observed. Among the institutions contributing most prominently to the field were Harvard University, King’s College London, and the University of Melbourne. In conclusion, the COVID-19 pandemic has significantly intensified the psychosocial burden on healthcare professionals. The growing body of research in the post-pandemic period underscores the importance of global collaboration and interdisciplinary approaches to support healthcare workers’ mental well-being and resilience.

**Keywords:** COVID-19, Burnout, Psychological distress, Health services, Management.

<sup>1</sup>Osmaniye Korkut Ata University, Faculty of Health Science, Department of Gerontology, Osmaniye, Türkiye.

**Address of Correspondence/Yazışma Adresi:** Melek Yağcı Özen, Osmaniye Korkut Ata University, Faculty of Health Sciences, Department of Gerontology, No: D2/123, Central, Osmaniye, Türkiye, 0531-916-02-97, E-mail: melekyagciozen@hotmail.com.

**Date of Received/Geliş Tarihi:** 14.07.2025, **Date of Revision/Düzeltilme Tarihi:** 03.01.2026, **Date of Acceptance/Kabul Tarihi:** 21.01.2026, **Date of Online Publication/Çevrimiçi Yayın Tarihi:** 15.06.2026

**Citing/Referans Gösterimi:** Özen, M. Y. (2026). Post-pandemic healthcare workers: A comprehensive bibliometric evaluation of psychosocial impacts and health management strategies. *Cyprus Turkish Journal of Psychiatry & Psychology*, 8(2), 165-175, Doi:10.35365/ctjpp.26.2.07

© 2026 The Author(s). Published by Cyprus Mental Health Institute / Cyprus Turkish Journal of Psychiatry and Psychology (www.ktpppdergisi.com). This article is an open-access article distributed under the terms and conditions of the Creative Commons Attribution 4.0 license, which permits use, sharing, adaptation, distribution, and reproduction in any medium or format, provided the original work is properly cited and is not used for commercial purposes.

<http://creativecommons.org/licenses/by/4.0/>

**Öz:**

Bu çalışmada, COVID-19 pandemisinin sağlık çalışanları üzerindeki psikososyal etkileri ile bu etkilerin sağlık yönetimi alanındaki yansımalarının bibliyometrik analiz yöntemiyle değerlendirilmesi amaçlanmıştır. Bu doğrultuda, “COVID-19”, “healthcare workers”, “psychosocial effects” ve “health management” anahtar kelimeleri kullanılarak Web of Science veri tabanında sistematik bir tarama yapılmıştır. 2019 yılı sonrasında yayımlanmış, İngilizce dilinde kaleme alınmış ve SCI, SSCI, A&HCI, ESCI ile SCI-Expanded indekslerinde yer alan araştırma makaleleri çalışmaya dâhil edilmiştir. Bibliyometrik analiz kapsamında; anahtar kelime eş-görünüm ağları, ortak yazarlık iş birliği desenleri, önde gelen kurumlar ve ülkelerin alana katkıları incelenmiştir. Toplam 6.341 makale analiz edilmiştir. Bulgular, özellikle 2021 yılı sonrasında sağlık çalışanları arasında ruh sağlığı, tükenmişlik, stres ve iş yükü gibi konulara yönelik araştırma ilgisinin belirgin biçimde arttığını göstermektedir. En sık kullanılan anahtar terimler “mental health”, “burnout” ve “psychological distress” olmuştur. Ayrıca, uluslararası ve disiplinlerarası birliğe yönelik çalışmalarında da kayda değer bir artış gözlenmiştir. Alana en fazla katkı sağlayan kurumlar arasında Harvard University, King’s College London ve University of Melbourne öne çıkmıştır. Sonuç olarak, COVID-19 pandemisinin sağlık profesyonelleri üzerindeki psikososyal yükü önemli ölçüde artırdığı görülmektedir. Pandemi sonrası dönemde artan araştırma hacmi, sağlık çalışanlarının ruhsal iyilik hâlinin ve psikolojik dayanıklılığının desteklenmesinde küresel iş birliğinin ve disiplinlerarası yaklaşımların önemini vurgulamaktadır.

**Anahtar Kelimeler:** COVID-19, Tükenmişlik, Psikolojik stres, Sağlık hizmetleri, Yönetim.

**Introduction**

Throughout history, pandemics have resulted in the loss of millions of lives and have triggered significant societal transformations. Among these global health crises, the COVID-19 pandemic has occupied a prominent place due to both its rapid spread and the scale of the population it has affected (Heath et al., 2020; Sakaoğlu et al., 2020; Wang et al., 2020). Emerging in Wuhan, China, in December 2019, COVID-19 quickly spread worldwide and was declared a pandemic by the World Health Organization (WHO) (Xiong et al., 2020). With the rapid global spread of the pandemic, individuals' daily routines underwent considerable disruption, and psychological factors such as fear of infection, uncertainty, anxiety, and social isolation had adverse effects on public mental health (Luo et al., 2020; Batra et al., 2020; Arpacioğlu et al., 2021).

One of the most affected professional groups during this period was healthcare workers. In this process, healthcare professionals, unlike the general population, who stayed at home to mitigate the risk of COVID-19 transmission, were required to maintain the delivery of healthcare services (Lancet, 2020). Their direct contact with infected individuals exposed them not only to biological risks but also subjected them to significant stress due to increased workload, extended working hours, and psychosocial pressures (Shreffler et al., 2020; Arpacioğlu et al., 2021; Yumru, 2020). The occupational pressures experienced by healthcare workers during the pandemic contributed to an increase in mental health issues such as burnout, stress, and anxiety, severely impacting their job satisfaction and professional motivation (Pala and Metintaş, 2020).

Particularly, healthcare professionals working in intensive care units played a critical role in the monitoring and treatment of COVID-19 patients and faced additional psychological and physical burdens throughout this process. Prolonged use of protective equipment, extended shifts, and social isolation adversely affected their psychological well-being, leading to elevated levels of burnout, depression, and anxiety (Lai et al., 2020; Karadağ and Çiçek, 2023). Research has shown that healthcare workers directly involved in the care of COVID-19 patients experienced higher levels of anxiety and depression compared to their counterparts not engaged in

patient care (Arpacioğlu et al., 2021). These findings highlight that the pandemic posed a significant threat not only to public health but also to the psychosocial well-being of healthcare professionals.

Healthcare workers are exposed not only to biological risks but also to various physical, chemical, and psychosocial hazards inherent in their profession. The risk of contracting infectious diseases, injuries from sharp objects, radiation exposure, and ergonomic problems is among the factors threatening their professional lives (Gürer and Gemlik, 2020). Additionally, factors such as high work intensity, long shifts, and violence against healthcare workers are primary contributors to the deterioration of their mental health. Particularly during the pandemic, increased workload and psychological pressures led many healthcare professionals to experience burnout syndrome, significantly reducing their motivation and job satisfaction (Søvold ve diğerleri, 2021). This circumstance underscores that healthcare workers face the dual burden of managing the challenges posed by COVID-19 while simultaneously being at heightened risk for developing mental health issues (Greenberg et al., 2020).

Despite these challenges, healthcare workers demonstrated remarkable dedication in ensuring the continuity of healthcare services during the pandemic (Kıroğlu, 2020). However, the long-term effects of the physical and psychological burdens they faced during this period should not be overlooked. Understanding how scientific interest has evolved regarding issues such as mental health, burnout, and workload among healthcare workers in the post-pandemic period is crucial to building more resilient healthcare systems. In this context, the present study aims to conduct a bibliometric analysis of the scientific publications addressing the psychosocial impacts on healthcare workers following the COVID-19 pandemic.

Previous bibliometric studies have explored various dimensions of COVID-19-related research, including mental health (Zhong and Lin, 2022; Farooq et al., 2021; Wang and Tian, 2021; Yu et al., 2021). In some studies, mental health has been the central focus of bibliometric analyses, particularly regarding the psychological

consequences of the COVID-19 pandemic (Chen et al. 2021; Akintunde et al. 2021; Ellis et al. 2021; Maalouf et al. 2021; Rani et al. 2021). Despite the growing body of COVID-19 research, relatively few bibliometric analyses have focused on the psychosocial experiences of healthcare workers (Korkmaz and Altuntaş, 2022; Porkodi and Pundhir, 2025). Unlike previous studies, the present research offers a comprehensive bibliometric evaluation that focuses specifically on the post-pandemic psychosocial impacts on healthcare workers, integrating both mental health and health management perspectives.

By mapping keyword co-occurrences, co-authorship networks, institutional collaborations, and citation patterns, this study provides an interdisciplinary and up-to-date overview of how academic attention has evolved toward the psychological and organizational challenges faced by healthcare professionals after the peak of the pandemic.

## Method

In this study, a bibliometric analysis was conducted on scientific publications addressing the psychosocial impacts on healthcare workers in the aftermath of the COVID-19 pandemic. Bibliometric analysis is a systematic method for examining publication trends, scientific collaborations, and research dynamics within a specific academic field (Merigo and Yang, 2017). Within this context, particular attention was given to analyzing how scientific interest has evolved regarding healthcare workers' mental health, burnout, and workload in the post-pandemic period.

### Data Collection Process

This study is based on a bibliometric analysis conducted in the Web of Science (WoS) database and aims to examine the psychosocial impacts of the COVID-19 pandemic on healthcare workers and their reflections in health management. In line with this objective, a title-specific search was conducted using various keywords related to COVID-19, healthcare workers, psychosocial impacts, and health management, in different combinations.

In the initial stage, a broad search identified 3,789,191 academic records. However, the analysis was limited exclusively to research articles, and publications indexed in SCI, SSCI, A&HCI, ESCI, and SCI-Expanded were selected.

### Search Terms Used

A comprehensive literature search was conducted in the Web of Science Core Collection on [February 20, 2025], using the following Boolean string:

("COVID-19" OR "post-pandemic" OR "pandemic aftermath" OR "pandemic impact" OR "COVID-19 recovery") AND ("healthcare workers" OR "medical professionals" OR "nurses" OR "doctors" OR "frontline staff" OR "health professionals" OR "healthcare personnel") AND ("mental health" OR "psychological effects" OR "stress" OR "burnout" OR "emotional well-being" OR "psychological distress" OR "work-related stress" OR "anxiety" OR "depression") AND ("healthcare management" OR "health policy" OR "crisis management" OR "occupational health" OR "management strategies" OR "organizational support" OR "resilience programs" OR "workforce management" OR "healthcare administration" OR "health system management")

The search was limited to English-language research articles published between 2020 and 2024 and indexed in SCI, SSCI, A&HCI, ESCI, and SCI-Expanded. Publications without accessible full texts were excluded.

This search yielded 6,341 articles, which were included in the bibliometric analysis.

### Data Analysis and Bibliometric Methods

In the bibliometric analysis, VOSviewer software was employed to examine the scientific contributions and trends in academic publications (Eck and Waltman, 2010). The following methods were applied in the analysis:

**Co-authorship Analysis:** Co-authorship analysis was conducted to examine collaboration patterns among authors and to identify influential researchers within the field (Donthu et al., 2021; Passas, 2024). To determine the collaborative networks and academic partnerships among researchers, the most influential authors and their co-authorship patterns were analyzed.

**Keyword Co-occurrence Analysis:** The most frequently used keywords related to COVID-19 and its psychosocial impacts on healthcare workers were identified, and their relationships were visualized. Keyword co-occurrence analysis enables the detection of dominant research themes and emerging topics within a field (Donthu et al., 2021).

As an extension of the keyword co-occurrence analysis, temporal mapping was performed using overlay visualization to examine changes in scientific interest across different phases of the COVID-19 pandemic. Keywords were color-coded by their average publication year, enabling the identification of themes that gained prominence during specific periods.

**Institutional Collaboration and Impact Analysis:** Leading research centers and universities in the field were identified, and an analysis was conducted to determine which institutions have been at the forefront of research in this area. This approach highlights organizations that play a central role in knowledge production and dissemination in the field (Donthu et al., 2021).

**Country-Level Scientific Collaboration:** The geographical distribution of research output was mapped to highlight countries with the highest concentrations of studies and patterns of international scientific collaboration.

**Citation Analysis:** Citation counts were used to identify the most influential publications and journals in the field and to compare publication productivity and citation impact. Citation frequency was used as an indicator of scientific impact and scholarly visibility within the literature (Donthu et al., 2021).

The findings obtained from this analysis provide significant insights into the development and trends of scientific research addressing the psychosocial impacts of the pandemic on healthcare workers. The results of the bibliometric analysis offer a valuable perspective on the directions in which the field has advanced and highlight areas where future research should be concentrated.

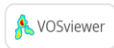
### Co-authorship Analyses

#### Co-authorship of Authors

Co-authorship is the collaborative process in which authors work together to produce academic publications, such as articles, reports, or research papers. Co-authorship

analysis is used to examine the collaborative relationships among authors. In this study, a minimum threshold of two publications and two citations was set to generate the network map.

The resulting map illustrates the collaboration patterns among the 18 authors with the most connections. These 18 authors are grouped into five distinct clusters, reflecting their collaborative networks. These patterns are visually presented in Figure 1.



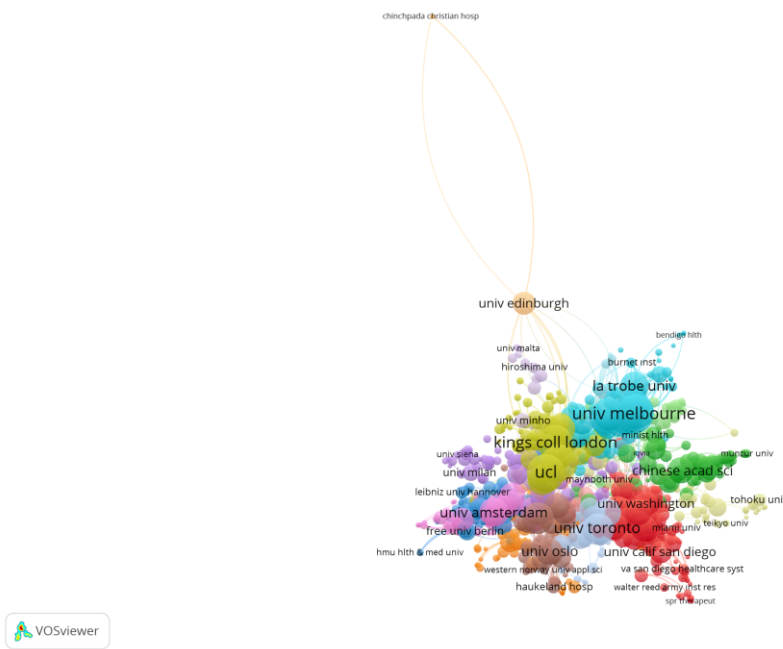
**Figure 1:** Co-authorship network of authors on COVID-19 and psychosocial impacts research

The resulting network structure visualizes the collaborative relationships among authors. In the graph, the nodes represent individual authors, while the lines connecting them indicate co-authorship. The clusters, distinguished by different colors, reveal distinct groups of collaborators and research networks. Authors positioned at the center of the network, such as Zhang Yan and Li Yang, have collaborated more frequently with others, thereby positioning them as central figures. This suggests that these authors have made significant contributions to the field and are among the key influencers shaping the literature. On the other hand, authors located at the periphery of the network have engaged in fewer collaborations or have been involved in specific, isolated collaboration groups. This analysis contributes to

understanding the dynamics of scientific collaboration among researchers and provides valuable insights for identifying potential future collaboration opportunities.

#### Co-authorships of Organizations

The co-authorship analysis of organizations illustrates the institutional collaborations present within the analyzed publications. The visualization displays which institutions have collaborated and the intensity of these collaborations. According to the generated network map, 1,000 items were included, forming 16 distinct clusters. The largest cluster comprises 181 items, indicating a dense network of institutional partnerships within this group. These inter-institutional collaborations are visualized in Figure 2.



**Figure 2:** Institutional co-authorship network in COVID-19 and psychosocial impact research

Among the prominent institutions in co-authorship and collaboration networks are prestigious universities such as the University of Melbourne, King’s College London, and the University of Toronto. These institutions are positioned at the center of the network, indicating they are

the most collaborative in the literature on the impacts of COVID-19 on healthcare workers. In contrast, institutions such as the University of Edinburgh and the Christian Hospital appear more isolated, suggesting they have fewer academic collaborations.

**Table 1:** Top institutions by number of publications and citations in COVID-19 research

No	Institution	Number of Publications	Institution	Number of Citations
1	University of Melbourne	113	University College London	304
2	University College London	110	Queen's University Belfast	286
3	University of Oxford	106	Harvard University	254
4	King's College London	97	Cairo University	251
5	Monash University	95	Clemson University	247

Table 1 presents the universities with the highest number of publications and citations related to COVID-19. In terms of publication count, the most productive academic institutions are the University of Melbourne (113 publications), University College London (110 publications), University of Oxford (106 publications), King’s College London (97 publications), and Monash University (95 publications). The fact that these leading universities are primarily based in the United Kingdom and Australia highlights the significant academic influence of these regions in COVID-19 research.

On the other hand, when examining the institutions with the highest citation counts, University College London (304 citations) emerges as one of the most impactful institutions, followed by Queen’s University Belfast (286 citations), Harvard University (254 citations), and Cairo

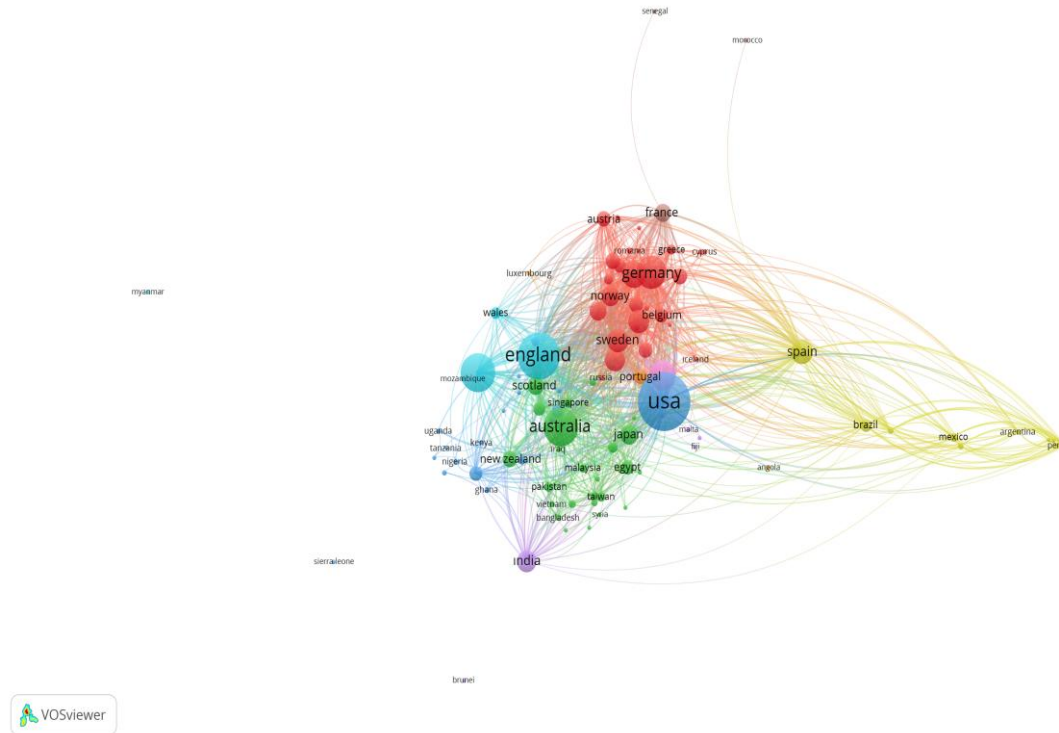
University (251 citations), and Clemson University (247 citations). The high number of citations indicates that the research outputs from these universities have resonated widely in the literature, demonstrating their strong influence within the scientific community.

**Co-authorship of Countries**

Figure 3 presents a country-level bibliometric map illustrating the academic collaboration networks related to COVID-19. On the map, node size represents each country's influence in the scientific collaboration network, and lines indicate co-authorship relationships between countries. The United States (USA) is the largest node, indicating it is the country with the most international scientific collaborations. Notably, the USA demonstrates strong academic ties with countries such as the United Kingdom, Germany, Australia, and India.

The map also displays clusters of countries in different colors, reflecting distinct groups of collaborators. The red cluster predominantly comprises Germany-centered European countries, whereas the blue cluster comprises the United Kingdom and other English-speaking countries. The green cluster represents India and countries in the Asia-Pacific region, while the yellow cluster comprises Latin American and Iberian countries, including Spain, Brazil, and Mexico.

As illustrated by the map, international collaboration has played a crucial role in COVID-19 research, with particularly strong academic connections observed among developed countries. However, the map also reveals that some countries appear relatively isolated and less integrated into the global academic network. The country-level co-authorship network is depicted in Figure 3.



**Figure 3:** Country-level co-authorship network in COVID-19 and psychosocial impact research

**Keyword Analyses**

Through keyword analysis, clusters of keywords were identified based on their co-occurrence frequencies across the included studies, highlighting their correlations and thematic relationships. In the analysis, each cluster is represented by a distinct color.

The bibliometric network map presented in Figure 4 visualizes the distribution of key topics and their interrelations within the academic research on COVID-19. At the center of the map, the term "COVID-19" appears as the largest and most interconnected node, underscoring the pandemic's central role in the scientific literature. The topic clusters depicted in various colors reflect the multidisciplinary impact of COVID-19 research.

Terms such as "mental health," "depression," "stress," and "psychological distress," concentrated within the yellow-green cluster, demonstrate the widespread academic focus

on the pandemic's effects on psychological well-being. In the red cluster, biomedical topics such as "oxidative stress," "inflammation," "metabolism," and "apoptosis" highlight the extensive body of research exploring the biological impacts of COVID-19. The blue-green cluster emphasizes terms such as "public health," "vaccine hesitancy," "telehealth," and "health policy," indicating the comprehensive attention given to public health management during the pandemic.

The thick lines on the map represent strong connections among keywords, particularly among COVID-19, mental health, public health policies, and biomedical research. These findings reveal that the pandemic has exerted a broad impact not only on physical health but also on psychological and societal domains, underscoring the growing importance of interdisciplinary research in this area.



The color coding in the map visualizes the evolution of research trends over time, indicating that during the initial phase of the pandemic, studies predominantly focused on public health and transmissibility, whereas in later periods, the emphasis shifted toward biomedical effects, psychological health, and social factors. In this context, Figure 5 provides a valuable visualization for understanding the multidimensional impacts of COVID-19 and the interdisciplinary approaches adopted in academic research.

### Citation Analyses

Table 2 presents the five most-cited publications in the academic literature on COVID-19. The publication with the highest number of citations is Richard (2020), with 222 citations, making it the most-cited source in its field. This

is followed by Loey (2020) with 171 citations, Kwekha-Rashid (2021) with 164 citations, Pullano (2020) with 148 citations, and Milijeteig (2021) with 78 citations. The high citation counts indicate the significant impact these studies have had within their respective research areas and their broad resonance in the literature.

Notably, the majority of these influential studies were published in 2020 and 2021, suggesting that early-stage research conducted at the onset of the COVID-19 pandemic garnered substantial academic attention and served as a guiding force for subsequent studies. This analysis contributes to understanding research trends in the field by identifying the most impactful sources on COVID-19.

**Table 2:** Top five most cited publications in COVID-19 research

No	Author	Number of Citations
1	Richard (2020)	222
2	Loey (2020)	171
3	Kwekha-Rashid (2021)	164
4	Pullano (2020)	148
5	Milijeteig (2021)	78

Table 3 presents the journals with the highest numbers of COVID-19 publications and citations. The journal with the greatest number of publications is *Current Psychology*, with 83 articles, followed by *Omega – Journal of Death and Dying* (66 articles), *Child Psychiatry & Human Development* (58 articles), *International Journal of Mental Health and Addiction* (50 articles), and *Development and Psychopathology* (43 articles). This indicates that COVID-19 research has been predominantly focused on psychology, psychiatry, and mental health.

On the other hand, when examining the journals with the highest citation counts, the *Journal of Ambient Intelligence*

and *Humanized Computing* ranks first with 239 citations, followed by *Annals of Operations Research* (225 citations), *Nature Medicine* (208 citations), *Applied Nanoscience* (204 citations), and *Neural Computing & Applications* (193 citations). It is noteworthy that the most cited journals span multidisciplinary fields such as artificial intelligence, medicine, nanotechnology, and computational sciences. This demonstrates that COVID-19-related research has had a significant impact not only in the health sciences but also in areas such as engineering, data science, and operations research.

**Table 3:** Leading journals by number of publications and citations in COVID-19 research

No	Journal	Number of Publications	Journal	Number of Citations
1	Current Psychology	83	Journal of Ambient Intelligence and Humanized Computing	239
2	Omega-Journal of Death and Dying	66	Annals of Operations Research	225
3	Child Psychiatry&Human Development	58	Nature Medicine	208
4	International Journal of Mental Health and Addiction	50	Applied Nanoscience	204
5	Development and Psychopathology	43	Neural Computing&Applications	193

### Discussion

The primary objective of this bibliometric analysis was to examine the structure and evolution of COVID-19-related academic research by focusing on author collaborations, institutional and international academic partnerships, publication and citation performance, keyword patterns,

and temporal research trends. The findings indicate that the pandemic has had a broad impact on the scientific community and has been addressed across different disciplinary contexts (Aristovnik et al., 2020; Chahrour et al., 2020; Yu et al., 2020).

An examination of author collaboration networks revealed that researchers such as Zhang Yan and Li Yang had more connections than other authors and were positioned at the center of the academic network. This finding suggests that these authors engaged in more intensive collaborations in COVID-19 research and held an important position in the literature. In contrast, some authors had fewer collaborations and remained outside specific collaboration clusters.

Institutional-level analyses demonstrated that universities such as the University of Melbourne, University College London, and the University of Oxford were among the most productive in COVID-19 research publications. However, when institutions with the highest citation counts were examined, universities such as University College London, Harvard University, and Queen's University Belfast stood out for their academic impact. This finding indicates that publication volume alone is insufficient to assess scientific impact and that citation counts are also an important indicator. Similarly, Yu et al. (2020) emphasized that productivity and impact indicators should be evaluated together in bibliometric analyses.

Country-based analyses showed that the United States had the highest level of scientific collaboration in COVID-19 research. The United States was found to have strong academic connections, particularly with the United Kingdom, Germany, Australia, and India. This finding is consistent with the results reported by Korkmaz and Altuntaş (2022) and Akintunde et al. (2021). Additionally, other bibliometric studies on COVID-19 have also reported that the United States is the most productive country in terms of publication output (Farooq et al., 2021; Dong et al., 2022). However, some bibliometric analyses have reported China as the leading country, followed by the United States. This discrepancy may be attributed to differences in analytical focus, as many previous studies primarily emphasized biomedical and epidemiological research (Chahrour et al., 2020; Dehghanbanadaki et al., 2020), whereas the present study adopts a broader bibliometric framework that also incorporates the psychosocial impacts of COVID-19. Nevertheless, some countries were observed to occupy relatively isolated positions within international academic collaboration networks.

Keyword analyses indicated that COVID-19 has generated a broad research domain and has been examined across various fields, including the health sciences, psychosocial impacts, and public health policies. Similarly, a bibliometric analysis of the most highly cited publications on COVID-19 found that research has predominantly focused on the pandemic's public health and mental health impacts (Liew et al., 2024). In particular, the prominence of topics such as mental health, depression, stress, and burnout demonstrates that the psychosocial effects of the pandemic on individuals have occupied an important place in the academic literature. These findings are consistent with previous bibliometric studies examining the mental health impacts of COVID-19 (Akintunde et al., 2021; Korkmaz & Altuntaş, 2022). In addition to biomedical terms such as oxidative stress, inflammation, and metabolism, the literature also identified concepts related to public health policies, vaccine hesitancy, and telehealth (Farooq et al., 2021).

Evaluations based on the temporal dimension showed that research during the early stages of the pandemic primarily

focused on transmissibility and public health measures, whereas psychosocial effects and mental health issues became more prominent in later periods. The increasing focus on topics such as mental health and burnout in recent years indicates that the long-term effects of the pandemic are being increasingly addressed in scientific research.

Citation analyses revealed that the most highly cited studies were largely published in 2020 and 2021. The fact that these studies were conducted during the early phase of the COVID-19 pandemic suggests they served as a guiding force for subsequent research. This finding highlights the critical role of early-stage scientific research in shaping subsequent studies and informing responses during global health crises. Consistent with this observation, Maalouf et al. (2021) reported that publications produced during the early phases of outbreaks such as COVID-19, Ebola, and H1N1 tend to achieve greater visibility and exert a stronger influence within the scientific literature.

It is also noteworthy that journals publishing research on the psychosocial impacts of COVID-19 on healthcare workers are predominantly in psychology and psychiatry, including *Current Psychology*, *Omega – Journal of Death and Dying*, and *Child Psychiatry & Human Development*. Similarly, Akintunde et al. (2021), in their bibliometric analysis of the mental health impacts of the COVID-19 pandemic, emphasized that this research area is most concentrated within the disciplines of psychiatry and psychology. Conversely, the most-cited journals include the *Journal of Ambient Intelligence and Humanized Computing*, *Annals of Operations Research*, and *Nature Medicine*. This demonstrates that COVID-19 research has not been confined to health sciences alone but has also significantly influenced fields such as data science, engineering, and computational sciences.

Based on these findings, future studies are encouraged to examine the long-term course of burnout and psychological distress among healthcare workers in the post-pandemic period, and to evaluate the effectiveness of organizational support mechanisms within health management practices. Moreover, given that the existing literature is predominantly focused on high-income countries, comparative studies that incorporate diverse healthcare system contexts may make valuable contributions to the field (Wang and Tian, 2021).

## Conclusion

The analyses conducted in this study demonstrate that COVID-19 has generated a vast research domain within the scientific community and that multidisciplinary studies are gaining increasing significance. During the pandemic, international academic collaborations intensified, interdisciplinary approaches were more widely adopted, and research focusing on public health policies accelerated. In this context, it is recommended that future studies further promote multidisciplinary collaborations and particularly focus on the long-term psychosocial impacts of the pandemic.

In conclusion, COVID-19 has not only been a public health crisis but also a turning point that reshaped research dynamics, fostered academic collaborations, and accelerated global knowledge production. This study not only evaluates the pandemic's impact on the scientific literature but also offers key insights into how the academic community can respond more effectively to future global crises.

## Limitations

This study makes a valuable contribution to the literature by evaluating scientific productivity, citation impact, and academic collaborations in COVID-19 research using a bibliometric analysis. Unlike previous studies that focused on specific domains, this research offers an interdisciplinary perspective, visualizing how COVID-19 research has evolved across the scientific landscape.

However, certain limitations must be acknowledged. The analysis is based solely on one database, and publications from other databases were not included. In addition, institutional and journal names within the Web of Science database may appear in different formats due to abbreviations, spelling variations, or indexing differences. As no additional manual standardization or thesaurus-based harmonization was applied prior to analysis, such variations may have partially influenced the representation of institutional- and journal-level findings. Furthermore, as citation counts may change over time, different publications may receive higher citation counts in the future, potentially altering these findings.

## Declarations

### Ethics Approval

This study is a bibliometric analysis based on published literature and does not involve human or animal participants; therefore, ethics committee approval was not required.

### Informed Consent

Not applicable.

### Author Contribution Statement

The author solely conceived, designed, conducted, and wrote the study.

### Conflict of Interest

The author declares no conflict of interest.

### Funding

The author received no financial support for the research, authorship, or publication of this article.

### Data Availability

The data used in this study were retrieved from the Web of Science database. Access to the dataset is subject to the database's subscription and usage policies.

## References

- Akintunde, T. Y., Musa, T. H., Musa, H. H., Musa, I. H., Chen, S., Ibrahim, E., Tassang, A. E., & Helmy, M. S. E. D. M. (2021). Bibliometric analysis of global scientific literature on the effects of the COVID-19 pandemic on mental health. *Asian Journal of Psychiatry*, 63, 102753. <https://doi.org/10.1016/j.ajp.2021.102753>
- Arpacioğlu, M. S., Baltacı, Z., & Ünübol, B. (2021). Burnout, fear of COVID, depression, job satisfaction levels, and related factors among healthcare workers during the COVID-19 pandemic. *Çukurova Medical Journal*, 46(1), 88–100. <https://doi.org/10.17826/cumj.785609>
- Aristovnik, A., Ravselij, D., & Umek, L. (2020). A bibliometric analysis of COVID-19 across science and social science research landscape. *Sustainability*, 12(21), <https://doi.org/10.3390/su12219132>
- Batra, K., Singh, T. P., Sharma, M., Batra, R., & Schvaneveldt, N. (2020). Investigating the psychological impact of COVID-19 among healthcare workers: A meta-analysis. *International Journal of Environmental Research and Public Health*, 17(23), 9096. <https://doi.org/10.3390/ijerph17239096>
- Chahrour, M., Assi, S., & Bejjani, M. (2020). A bibliometric analysis of COVID-19 research activity: a call for increased output. *Cureus* 12(3). <https://doi.org/10.7759/cureus.7357>
- Chen, Y., Zhang, X., Chen, S., Zhang, Y., Wang, Y., Lu, Q., & Zhao, Y. (2021). Bibliometric analysis of mental health during the COVID-19 pandemic. *Asian Journal of Psychiatry*, 65, 102846. <https://doi.org/10.1016/j.ajp.2021.102846>
- Çiçek Korkmaz, A., & Altuntaş, S. (2022). A bibliometric analysis of COVID-19 publications in nursing by the visual mapping method. *Journal of Nursing Management*, 30(6), 1892–1902. <https://doi.org/10.1111/jonm.13636>
- Dehghanbanadaki, H., Seif, F., Vahidi, Y., Razi, F., Hashemi, E., Khoshmirsafa, M., & Aazami, H. (2020). Bibliometric analysis of global scientific research on Coronavirus (COVID-19). *Med J Islam Repub Iran*, 34 (51). <https://doi.org/10.34171/mjiri.34.51>
- Dong, X., Wei, X., Shu, F., Su, Q., Wang, J., Liu, N., & Qiu, J. (2022). A bibliometric analysis of the global psychological and behavioral research landscape on the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, 19(2), 879. <https://www.mdpi.com/1660-4601/19/2/879#>
- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, 133, 285–296. <https://doi.org/10.1016/j.jbusres.2021.04.070>
- Ellis, L. A., Meulenbroeks, I., Churruga, K., Pomare, C., Hatem, S., Harrison, R., Zurynski, Y., & Braithwaite, J. (2021). The application of e-mental health in response to COVID-19: scoping review and bibliometric analysis. *JMIR Mental Health*, 8(12), e32948. <https://doi.org/10.2196/32948>
- Farooq, R. K., Rehman, S. U., Ashiq, M., Siddique, N., & Ahmad, S. (2021). Bibliometric analysis of coronavirus disease (COVID-19) literature published in Web of Science 2019–2020. *Journal of Family and Community Medicine*, 28(1), 1–7. [https://doi.org/10.4103/jfcm.jfcm\\_332\\_20](https://doi.org/10.4103/jfcm.jfcm_332_20)
- Greenberg, N., Docherty, M., Gnanapragasam, S., & Wessely, S. (2020). Managing mental health challenges faced by healthcare workers during the COVID-19 pandemic. *BMJ*, 368. <https://doi.org/10.1136/bmj.m1211>
- Gürer, A., & Gemlik, H. N. (2020). A qualitative study on the problems experienced by healthcare workers during the COVID-19 pandemic and solution suggestions. *Journal of Health Services and Education*, 4(2), 45–52. <https://doi.org/10.29228/JOHSE.3>
- Heath, C., Sommerfield, A., & von Ungern-Sternberg, B.S. (2020). Resilience strategies to manage psychological distress among healthcare workers during the COVID-19 pandemic: a narrative review. *Anaesthesia*. 75(10), 1364–1371. <https://doi.org/10.1111/anae.15180>
- Karadağ, S., & Çiçek, B. (2023). Anxiety, depression, and burnout levels of nurses working in COVID-19 intensive care units. *OMEGA - Journal of Death and Dying* (Special Issue: COVID-19). <https://doi.org/10.1177/00302228231156313>
- Kıroğlu, F. (2020). Working conditions and general problems during the COVID-19 pandemic. *Meyad Academy*, 1(1), 79–90.
- Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., Wu, J., Du, H., Chen, T., Li, R., Tan, H., Kang, L., Yao, L., Huang, M., Wang, H., Wang, G., Liu, Z., & Hu, S. (2020). Factors associated with mental health outcomes among healthcare workers exposed to Coronavirus Disease 2019. *JAMA Network Open*, 3(3), e203976. <https://doi.org/10.1001/jamanetworkopen.2020.3976>

- Liew, Y.Y., Dong, Q., Lakshman, N., Khajuria, A. (2024). The 100 most-cited articles in COVID-19: a bibliometric analysis, *European Journal of Public Health*, 34 (4), 744–752, <https://doi.org/10.1093/eurpub/ckae098>.
- Luo, M., Guo, L., Yu, M., Jiang, W., & Wang, H. (2020). The psychological and mental impact of coronavirus disease 2019 (COVID-19) on medical staff and general public: A systematic review and meta-analysis. *Psychiatry Research*, 291, 113190. <https://doi.org/10.1016/j.psychres.2020.113190>
- Maalouf, F. T., Mdawar, B., Meho, L. I., & Akl, E. A. (2021). Mental health research in response to the COVID-19, Ebola, and H1N1 outbreaks: A comparative bibliometric analysis. *Journal of Psychiatric Research*, 132, 198–206. <https://doi.org/10.1016/j.jpsychires.2020.10.018>
- Merigó, J. M., & Yang, J. B. (2017). A bibliometric analysis of operations research and management science. *Omega*, 73, 37–48. <https://doi.org/10.1016/j.omega.2016.12.004>
- Pala, S. Ç., & Metintaş, S. (2020). Healthcare workers in the COVID-19 pandemic. *ESTÜDAM Journal of Public Health*, 5, 156–168. <https://doi.org/10.35232/estudamhsd.789806>
- Passas, I. (2024). Bibliometric analysis: the main steps. *Encyclopedia*, 4(2). <https://doi.org/10.3390/encyclopedia4020065>
- Porkodi, S., & Pundhir, S. (2025). Job satisfaction and burnout among healthcare employees: a bibliometric analysis before and after the COVID-19 pandemic. *Quality & Quantity*, 1–32. <https://doi.org/10.1007/s11135-025-02187-7>
- Rani, P., Yadav, A., Kumar, D., Pandey, J., Gull, M., Ansari, M. A., & Sahni, B. (2022). A bibliometric analysis of literature on COVID-19 and mental health. *National Journal of Community Medicine*, 13(09), 642–650. <https://doi.org/10.55489/njcm.130920222131>
- Sakaoğlu, H. H., Orbatu, D., Emiroğlu, M., & Çakır, Ö. (2020). State and trait anxiety levels of healthcare workers during the COVID-19 outbreak: A case from Tepecik Hospital. *Tepecik Education and Research Hospital Journal*, 30, 1–9. <https://doi.org/10.5222/terh.2020.56873>
- Shreffler, J., Petrey, J., & Huecker, M. (2020). The impact of COVID-19 on healthcare worker wellness: A scoping review. *Western Journal of Emergency Medicine*, 21(5), 1059–1066. <https://doi.org/10.5811/westjem.2020.7.48684>
- Søvold, L. E., Naslund, J. A., Kousoulis, A. A., Saxena, S., Qoronfleh, M. W., Grobler, C., & Münter, L. (2021). Prioritizing the mental health and well-being of healthcare workers: An urgent global public health priority. *Frontiers in Public Health*, 9, 679397. <https://doi.org/10.3389/fpubh.2021.679397>
- The Lancet. (2020). COVID-19: Protecting healthcare workers [Editorial]. *The Lancet*, 395(10228), 922. [https://doi.org/10.1016/S0140-6736\(20\)30644-9](https://doi.org/10.1016/S0140-6736(20)30644-9)
- Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 Coronavirus Disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health*, 17(5), 1729. <https://doi.org/10.3390/ijerph17051729>
- Wang, P., & Tian, D. (2021). Bibliometric analysis of global scientific research on COVID-19. *Journal of Biosafety and Biosecurity*, 3(1), 4–9. <https://doi.org/10.1016/j.jobbb.2020.12.002>
- Xiong, J., Lipsitz, O., Nasri, F., Lui, L. M., Gill, H., Phan, L., & McIntyre, R. S. (2020). Impact of COVID-19 pandemic on mental health in the general population: A systematic review. *Journal of Affective Disorders*, 277, 55–64. <https://doi.org/10.1016/j.jad.2020.08.001>
- Yu, Y., Li, Y., Zhang, Z., Gu, Z., Zhong, H., Zha, Q., & Chen, E. (2020). A bibliometric analysis using VOSviewer of publications on COVID-19. *Annals of Translational Medicine*, 8(13), 816. <https://doi.org/10.21037/atm-20-4235>
- Yumru, M. (2020). COVID-19 and burnout in healthcare workers. *Turkish Journal of Clinical Psychiatry*, 23, 75–80. <https://dx.doi.org/10.5505/kpd.2020.18942>
- Zhong, M., & Lin, M. (2022). Bibliometric analysis of the economy during the COVID-19 pandemic. *Heliyon*, 8(9). <https://doi.org/10.1016/j.heliyon.2022.e10757>