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Special Issue On Multidisciplinary Research

Effect of Covid 19 on Mental Health and Coping Strategies: A Bibliometric Analysis using Scopus Database

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Abstract

Purpose – Coronavirus disease has resulted in an unexpected negative situation globally, impacting physical and psychological distress among people leading to various psychological problems. This study has been undertaken to comprehensively examine current research about the effect of COVID-19 on mental health of people in general and strategies adopted to recover. This study involves bibliometric analysis of available research work on Scopus data base on the selected theme using 355 documents as a sample for the analysis. The results affirmed that the mental well-being of individuals worldwide has been impacted by the loss of loved ones, financial setbacks resulting from job cuts, and the experience of isolation. The findings may help researchers and academicians better understand the research in the area of managing mental health during trying times. The study can be extended to structured literature review which will provide better insight into the methods or techniques used by people with varying demographics while coping with mental health issues.

Keywords: COVID-19, Anxiety, Stress, Depression, Mental health, Loneliness, Psychological Impact.

1. Introduction

Year 2020 was extremely horrid in a way that there was a bundle of unpleasant news everywhere around and people were left with no other choice than to accept and adapt it.

COVID-19 changed our attitude towards life. People were full of insecurities, uncertainty and helplessness. Many lost their jobs and many other lost their friends, family and other loved ones. People were scared every moment and the news channels were all full of negative updates. Consequently, many people took to alcohol consumption and other undesirable and evil factors such as domestic violence. Challenges, loss of life, hardships, unemployment etc. existed in abundance. The altered lifestyle that comprised working from home, studying from home, and distance from family and loved ones had more of negative impact on our lives. All of this resulted in major health issues especially in terms of mental health.

Although covid-19 has seriously strained the mental health of all of us, it has left more impact on poor and disparaged. As per the reports, a 24x7 mental health helpline number received approximately 45000 calls in just 2 months. 52% of them came from anxiety, 22% out of seclusion, 11% due to depression, 5% sleeping difficulties and 4% due to worsening of existing mental issues.[1]

Government took various measures to fight against the pandemic situation. Countrywide lockdown was one such major action taken by governments across the globe to check the rapid transmission of the threatening virus. Strict lockdown measures led to inclination of people towards seclusion, depression, anxiety and restlessness. According to researches, approximately 7.62 crore cases of anxiety related disorders and 5.32 crore major depression related disorders were reported during pandemic in the year 2020,which is about 26% and 28 % increase in respective disorders. India is reported to have approximately 35% increase in mental disorders during the pandemic. So, it becomes necessary to study and make analysis of major problems faced by the general population and various means and measures adopted to cope up with the various difficulties faced.

The present study has been undertaken with the aim to select, examine and analyse research documents on the area of “effect of covid 19 on mental health and coping strategies”. It has explored research output for the selected topic on the

[1] **thehindu/author/aditya-anand-2744, June 04, 2020**

basis of yearly production and subject area. It also aims to examine the contribution of institutions to the advancement of the research on the stated topic. It also attempts to offer insights about the research work done in this area so far and guide researchers about scope of future work. The pertinent research questions of the study are:

- What is the bibliometric profile of the database in this area?
- Who are the most dominant authors, journals in this field of research?
- Which countries dominate the research in this area?
- What is the co-citation network among the authors?
- What are the significant key words and most trending topics in this area?

It further seeks to provide base for structured literature review to document coping strategies adopted by people of different demographics to deal with mental health issues caused by covid 19.

2. Conceptual Framework Development

2.1 Conceptual Framework:

In 2019, the emergence of COVID-19 posed a significant global health threat. The disease was first identified in Wuhan, China. COVID-19 primarily spread through respiratory system (Sharma et al., 2020). It was highly infectious. World Health Organization (WHO) declared it a pandemic owing to its rapid spread to nearly all countries in March 2020. According to WHO reports, there were over 550 million cases of COVID-19 with over 6 million deaths worldwide[2] at that time and number was growing rapidly.

Pandemics have been linked to various psychosocial pressures that impact individuals and their families. It has led to substantial disruptions to the life of people causing financial setbacks, limitations on outdoor activities, changes in sleep patterns, altered eating habits, and modifications in health

[2] https://www.who.int/europe/emergencies/situations/covid-19

behaviour. Uncertainty surrounding the COVID-19, unacquainted public health measures, deficiencies of essential supplies, financial losses, and conflicting information from authorities have heightened public concern. Those placed under quarantine have experienced a range of negative emotions including insomnia, anxiety, confusion, stress, panic, depression, anger, frustration, boredom, irritability and stigma. Healthcare systems, primarily focused on screening and controlling disease transmission, have inadvertently neglected the management of mental and psychological health, and overall well-being of the people.

According to research conducted by Vindegaard (2020) and Bonello (2021), physical, social, and economic conditions caused by the pandemic adversely affected the mental wellbeing of even those individuals who were earlier healthy. Individuals with previous record of mental health issues experienced worsening of their mental states. Phobic anxiety, panic buying, excessive consumption of negative news online, limited mobility and travel, avoidance of treatment facilities, and excessive television viewing were all associated with impaired self-control, mental fatigue, sleep disturbances, and mood disorders, as noted in the study conducted by Moreno (2020).

Furthermore, studies conducted by Hwang et al. (2021), and Awan (2021) reported an increase in addictive behaviours among the general population including internet addiction, pornography consumption, online gambling, alcoholism, and substance abuse during quarantine period. The confinement to home led to heightened household conflicts, domestic violence, and child abuse, as observed in the studies by Xu et al. (2021), and Kim (2021).

Moreover, research by Del Casale (2020) and Chamberlain et al. (2021) revealed that survivors of pandemic too faced post-traumatic stress disorder though symptoms observed in those who required hospitalization, ventilator support, or had pre-existing mental health conditions were more severe.

The implementation of orders restricting movement, although essential to control the spread of the virus, has detrimental effects due to their prolonged and repeated imposition, as indicated by Tarsitani et al. (2021) and Reger et al. (2020). The hostile experiences associated with these orders have led to

financial stress, social disorders, and emotional disturbances, resulting in increased cases of suicide attempts and depression (Reicher, 2020; Toubasi et al., 2021).

Sundarasen et al., (2020) noted that existing research on the psychological effect of COVID-19 have predominantly focused on medical professionals and university students, overlooking the severe consequences faced by the general population. Sahimi et al., (2021) and Roslan et al., (2021) carried research on Malaysians, exploring the relationship between knowledge of COVID-19, preparedness to address it, mental wellbeing, and quality of life. Their findings confirmed the negative impact of the pandemic on the mental health and quality of life of Malaysians. These findings have provided crucial insights for timely interventions targeting dysfunctional lifestyles that could potentially lead to the development of mental disorders (Lee, 2021).

2.2 Major Effects of Covid-19 on Mental Health:

Most relevant studies with respect to effect of pandemic, lockdown restrictions and quarantine on mental health with respect to global infections have been discussed below:

Table 1: Literature Review - Effect of Covid 19 on Mental Health

Author (Yr)	**Study Design & Sample**	**Results**	**Importance**
Budimir ,S et all. (2021)	Cross-sectional study, sample period after 4 weeks of lock down. Sample size-1005 Dependent variable-mental Health. Independent variables- Coping strategies.	The findings of the study revealed that positive thinking, support in faith, active stress coping and social support were positively related with life quality, well-being, and negatively with perceived stress, depression, anxiety, and insomnia.	Sample size had equal participation from men and women and reflected population truly. Belief in positive thinking, active coping, and social support helped in reducing mental health issues due to COVID-19 pandemic.

Athina Patelarou et. All (2021)	A multicentre cross-sectional study using on-line questionnaire to evaluate the depression levels of nursing students. Sample size- 787	The study revealed that 33% of the nursing students were under mild depression. Spanish student followed by Albanian were greatly affected with mental health issues and age has negative association with level of depression,	The effects of lockdown and isolation on the mental health of nursing students were obvious from the study. Provision of university-based mental health therapies was suggested by the researchers.
Xiao et al., 2020(a)	Cross-sectional study, self-rated questionnaire. 180 medical staff members who were treating covid-patients and were in potential contact with SARS	Mean anxiety scores 55.3 ± 14.2; Anxiety was positively correlated with stress and negatively with sleep quality, social support and self-efficiency.	An integrated administrative and psycho- social response to the occupational and psychological challenges caused by outbreaks was recommended in the study.
Xiao et al., 2020(b)	Cross-sectional, self- rated questionnaire. Sample included 170 individuals who were in self-isolation for 14 days.	Mean anxiety scores 55.3 ± 14.2; anxiety positively correlated with stress and negatively with sleep quality and social capital; social capital was positively correlated with sleep quality.	An integrated and psycho-social response needed to be given to all the individuals in self–isolation and quarantine.
Li et al., 2020	Cross –sectional study Sample included 214 individuals from general public, 234 front-line nurses working in hospital	Vicarious traumatization of non-front-line medical staff was more serious than that of front-line medical staff during the COVID-19 outbreak.	More importance was given to continuous tracking of the development of vicarious traumatization in medical staff as well as the general public.

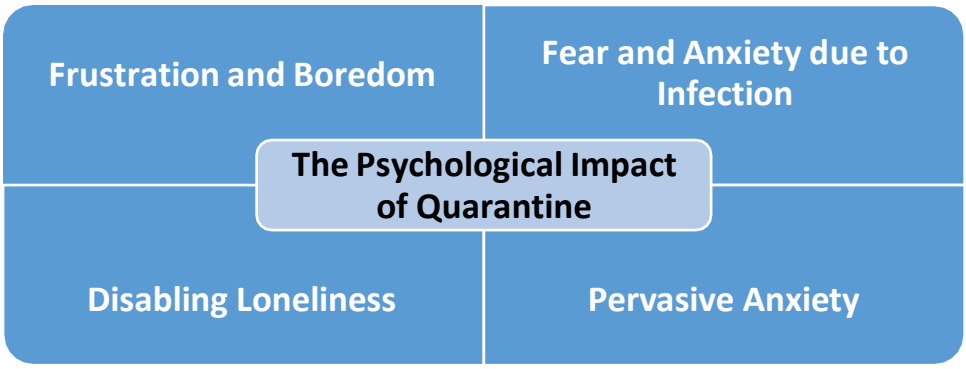
	and 292 non-front-line nurses.		
Wen Lu,. et al.,2020	Cross –sectional study and questionnaire survey Sample consisted of 2042 medical staff (doctors and nurses) and 257 administrative staff (including the logistics)	The proportion of medical staff group on moderate and severe fear was higher than that in the administrative staff group (70.6% VS 58.4%). 22.6% of medical staff members showed mild to moderate anxiety and 2.9% showed severe anxiety. Severity of depression was almost in same proportion in medical staff and administrative staff.	Medical staff observed with higher fear, anxiety and depression as compared to administrative staff. Effective strategies were needed to be provided to these individuals for improving their mental health.
Mohindra et al. (2020)	Qualitative analysis. Interviews with health care professionals. Sample included frontline health care providers (HP) of Tertiary hospital in North India involved in the care of patients with COVID-19 or suspected COVID-19	The main themes identified for mental health promotion of HP: 1. Positive Motivational factors a. Intellectual b. Emotional. 2. Negatives factors: frustrations associated with patient care, personal fears and annoyances experienced by doctors.	The study recommended use of emotional factors to improve mental wellbeing of health care providers

Ji et al., 2017	Cross sectional study. 161 individuals including 59 medical staff members of Sierra Leone, 21 members of logistic staff, 22 medical students, 41 members of Chinese medical staff and 18 EVD (Ebola Virus Disease) survivors.	EVD survivors were most sever in terms of obsession-compulsion, anxiety, hostility, phobic anxiety, and paranoid ideation and then range SL medical staff, SL logistic staff, SL medical students, and Chinese medical staff.	Post–traumatic stress disorders like anxiety, hostility, obsession, phobic anxiety becomes extremely severe and need more exposure and knowledge to cope up with these diseases.
Liu et al 2012	Cross-sectional 338 staff members treating infected patients in one of the hospitals in East Taiwan.	5% staff members reported an acute stress disorder. Anxiety, irritability, insomnia, poorer con-centration, and performance were all observed in the participants. Sixty-six staff members (20%) felt ignored and unwanted in society and were rejected in their neighbourhood.	Staff treating the infected patients in quarantine may be at high risk of prolonged depression.
Reynolds, et al 2008	Cross-sectional. 1912 adult individuals who have been quarantined as they were in close contact with those suffering from infection.	20 % of individuals reported fear, 18% nervousness, 18% sadness and 10% guilt. Abnormal psychological behaviour like avoiding direct contact with patients may be observed long after the quarantine also.	Psychological distress can be lowered by minimising Duration and improvement should be made in compliance procedures. Requirements may be revised and improved education and support should be implemented

Wu et al., 2008	Longitudinal prospective Randomly selected 549 employees of the hospital.	Present alcohol consumption and dependence long after the outbreak was associated with having been quarantined. Post –traumatic stress disorder and depression were also associated with increased alcohol dependence.	Severe infectious disease exposure may not only lead to Post –traumatic stress disorder but also other severities like excessive dependence on alcohol consumption.

Based on above discussion, the most relevant psychological impacts of Covid 19 on people in general can be summarised in Figure 1.

Figure1: Psychological Impact of Covid 19 on General Wellbeing of People



3. Research Methodology

3.1 Research Design

To examine the volume and quality of publications, as well as assess their impact and identify areas for further exploration, a bibliometric analysis has been conducted. The utilization of bibliometric analysis originated in the mid-20th century with Garfield, who employed it to appraise diverse subjects (Velasco-Munoz et al., 2018). This method, known as bibliometrics, serves to investigate research inclinations and identify contemporary areas of research interest (Yu et al., 2019). It is utilized for evaluating academic efficiency (Choudhri et al., 2015) and appraising the existing research landscape, providing insights for future research work. (Wang et al., 2020)

3.2 Sources of Data Collection

Scopus database has been used to collect data. Key words used to search data were “Effect of COVID 19 on mental health and coping strategies or methods”. The search resulted in a total of 411 documents. The research papers which were not published on that date were excluded leaving 385 published papers. Then, the papers which were not in English language were excluded. In all, it resulted in total 378 published papers in English. However, after initial screening of titles and abstracts another 23 papers were found to be irrelevant to the topic. Hence these papers were deleted for final analysis. Thus, the final bibliometric analysis was carried out on 355 published papers. Table 1 provides the details of the final sample for the analysis. The information has been collected for the period of 2019–2022.

Table 2. Research Data

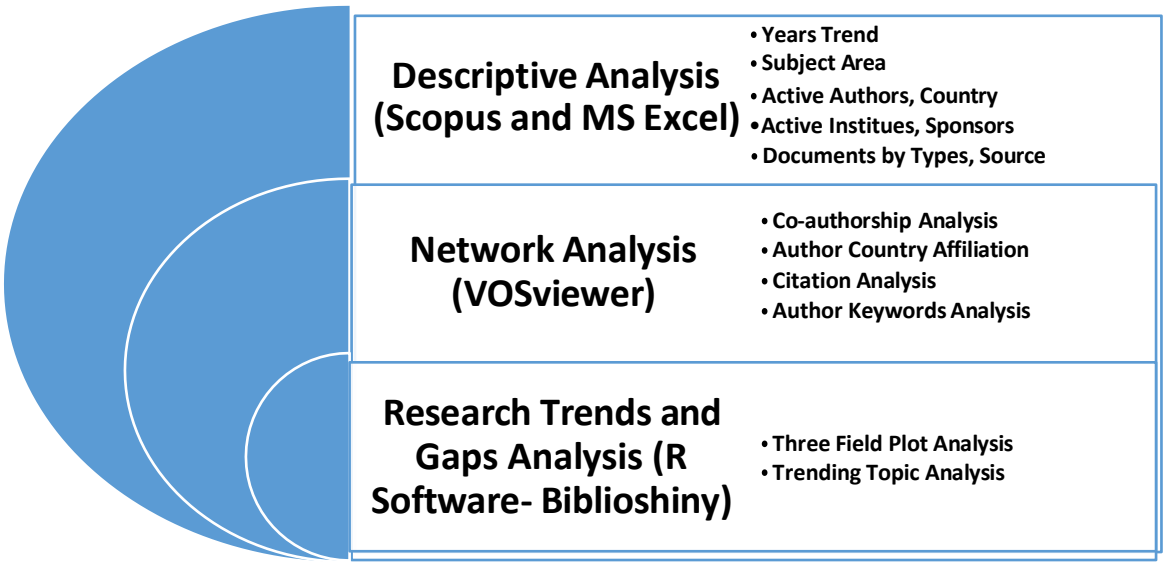
Search Key Words	Number of Papers
TITLE-ABS- KEY (effect AND of AND covid 19 on AND mental AND health AND coping AND strategies OR methods)	411
TITLE-ABS- KEY (effect AND of AND covid 19 on AND mental AND health AND coping AND strategies OR methods) AND (LIMIT-TO (PUBSTAGE , "final"))	385
TITLE-ABS- KEY (effect AND of AND covid 19 on AND mental AND health AND coping AND strategies OR methods) AND (LIMIT- TO (PUBSTAGE , "final")) AND (LIMIT- TO (LANGUAGE , "English"))	378
TITLE-ABS- KEY (effect AND of AND covid 19 on AND mental AND health AND coping AND strategies OR methods) AND (LIMIT- TO (PUBSTAGE , "final")) AND (LIMIT- TO (LANGUAGE , "English")) AND (EXCLUDE (DOCT YPE , "re"))	355

3.3 Analytical Procedures

The data has undergone bibliometric analysis using various tools including MS Excel, VOS viewer, and bibliometric tools integrated within the R Software. The analysis generated results encompassing publication year, document type, authorship, subject area, country, and affiliation. Figure 1 presents a conceptual framework illustrating the relationship between these variables under study and the techniques employed for analysis.

To prepare the data for analysis, it was exported from the database and organized, sorted, and simplified by Microsoft Excel. Subsequently, VOS viewer was utilized, which is a valuable tool in bibliometric analysis that facilitates the visualization of keyword co-occurrence through network visualization and overlay visualization to illustrate the interrelationships among different measurement parameters.

Figure 2: Tools used in the Analysis



4. Analysis and Discussion

4.1 Descriptive Analysis

4.1.1 Main Information

Table 3 provides key information about the data set.

Table 3: Key Information about the Data

Number of Documents	355
Timespan	2020:2022
Sources (Journals, Books, etc)	213
Annual Growth Rate %	-47.72
Document Average Age	1.58
Average citations per doc	13.35
Average citations per year per doc	3.337
References	18620
Keywords Plus (ID)	1628
Author's Keywords (DE)	842
Authors	2297
Authors of single-authored docs	11
Single-authored docs	11
Co-Authors per Doc	6.84
International co-authorships %	26.76

4.1.2 Research Productivity

Research productivity has been analysed on the basis of published documents each year in selected time span (Table 4). It is an indicative of overall pattern of research in the select field and popularity of the subject over time (Ahmi Mohammad and, 2019).

Table 4: Number of Publications Each Year

Year	No. of Pub.	%age	Cum. %
2020	42	11.83	11.83
2021	129	36.34	48.17
2022	184	51.83	100.00

Table 4 reveals that the very first publication on the topic appeared in 2020. There were 129 and 184 publications in the coming years 2021 and 2022. The overall publications for 2022 is likely to rise further with publication in fourth quarter. The increase in publications can be attributed to rising concern of Governments, institutions and public at large about mental health effects of the pandemic caused by loneliness, social distancing, loss of loved ones and financial crisis and need to find ways to manage it. It illustrates the progressive expansion

of literature addressing coping strategies for mental health challenges arising from COVID-19.

4.1.3 Types of Documents

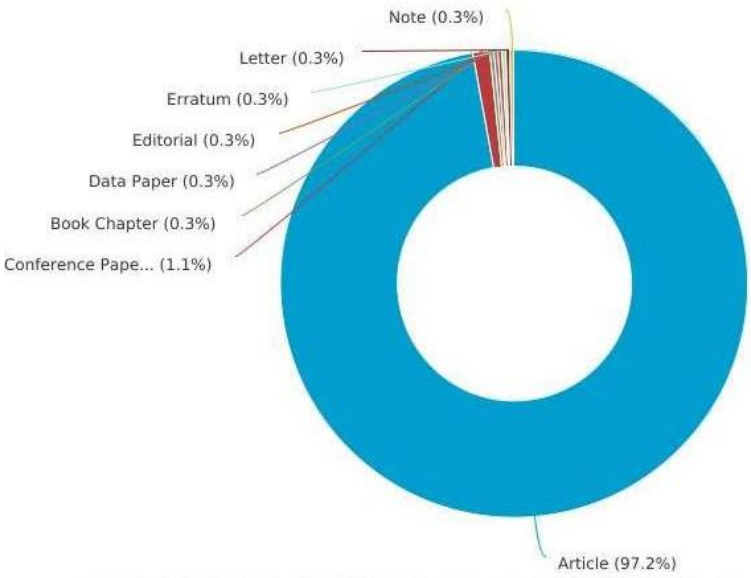
The research identified eight document types, namely articles in journals, conference papers, chapters in books, reviews, notes, editorials, and books. Most of the publications were journal articles, accounting for 97.18% of the total. The findings regarding the distribution of document types are displayed in Table 5.

Table 5: Types of Documents

Document Type	No.	Percentage
Article	345	97.18
Conference Paper	4	1.13
Book Chapter	1	0.28
Data Paper	1	0.28
Editorial	1	0.28
Erratum	1	0.28
Letter	1	0.28
Note	1	0.28

The findings provide an overview of the various source types of documents, with journal articles being the most predominant source, comprising 97.18% (345 documents) of the total. Conference papers accounted for 1.13% (4 documents), while book chapters, data papers, and editorials each represented a minimal portion. The majority of research in this field is disseminated through research journals, indicating a reliance on empirical and substantiated evidence. A pie chart showing graphical presentation of the results is given in Figure 3

Figure 3: Documents by Type



4.1.4 Documents by Source

Table 6 provides information regarding the top five significant sources of documents. "The International Journal of Environmental Research and Public Health" emerges as the leading source, with 50 documents, accounting for 14.08% of the total. Following closely is Frontiers in Psychiatry, contributing 22 documents (6.2%), and Frontiers in Psychology, which includes 14 documents (3.94%).

Table 6: Documents by Source

S. No.	Source Title	No. of Publications	Percentage
1	International Journal of Environmental Research and Public Health	50	14.08
2	Frontiers In Psychiatry	22	6.20
3	Frontiers In Psychology	14	3.94
4	Plos One	12	3.38
5	Frontiers In Public Health	9	2.54

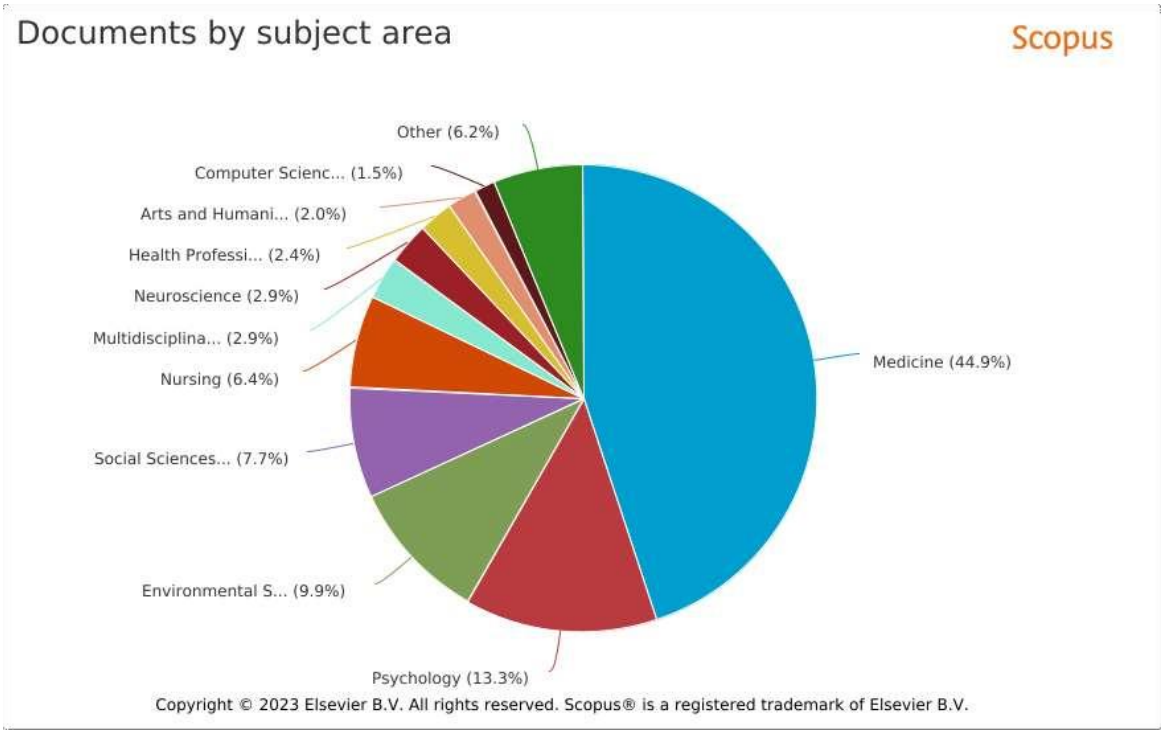
4.1.5 Documents by Subject Area

The primary subject areas in which publications were categorized, focusing on those with a minimum of ten publications were identified. Figure 4 visually represents the data through a pie chart, illustrating the division of subject areas into distinct sectors. The majority of the documents,

comprising nearly 70% of the total (246 publications), originated from the field of Medicine. Additionally, significant contributions were observed in the subject areas of Psychology, Environmental Science, Social Sciences, Nursing, and Multidisciplinary, each contributing approximately 10% of the total publications.

Majority of the publications in medicine and psychology subject area may be attributed to innovative research in this area. The field of medicine and psychology has witnessed a rising interest in the domain of mental health. Most of the research studies stated that in managing mental health issues, medicine and behavioural therapy played an important role.

Figure 4: Documents by Subject Area



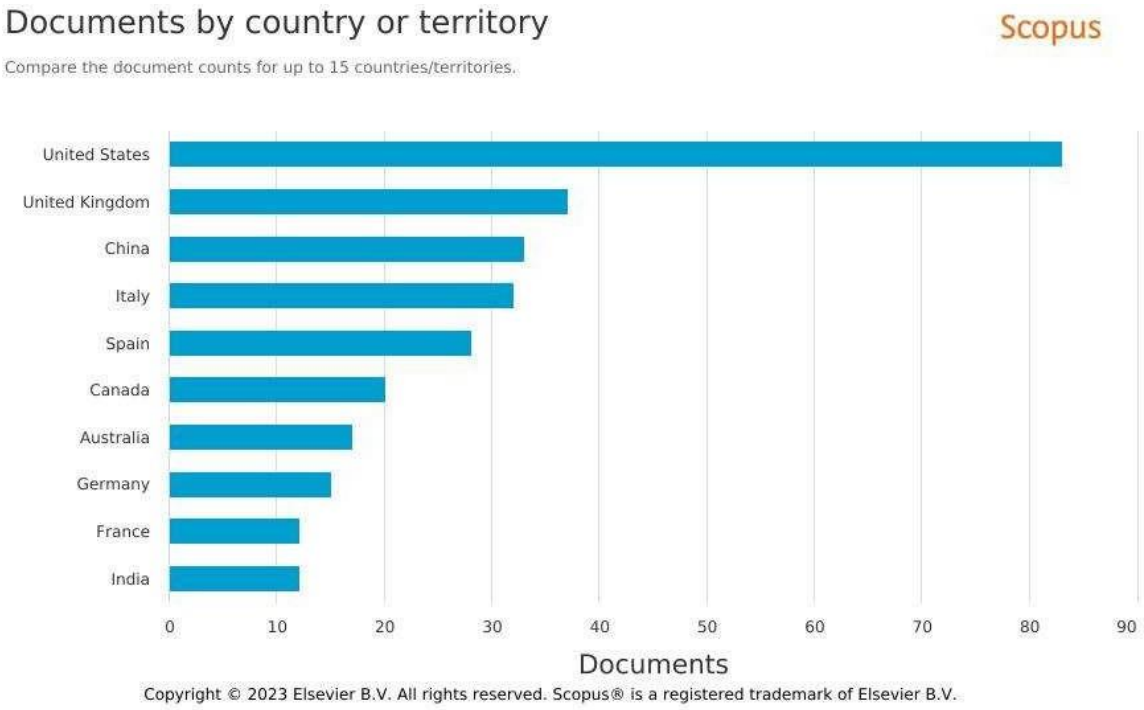
4.1.6 Distribution of Publications by Country

The publications were contributed by 97 nations. Figure 5 shows the list of the countries with more than 10 publications. The United States emerges as the top contributor, with 83 publications, accounting for 23.38% of the total. Following closely are the United Kingdom with 10.42%, China with 9.30%, and Italy with 9.01% of the publications.

The variation in the publications of different countries may be linked to elements like economic growth, the presence of

organisations dedicated to research and development, human skills, and financial accessibility. It has been noted that the United States has the most publications, followed by the United Kingdom. However, just 12 articles from India were found in our investigation, making it a country with a very small number of publications.

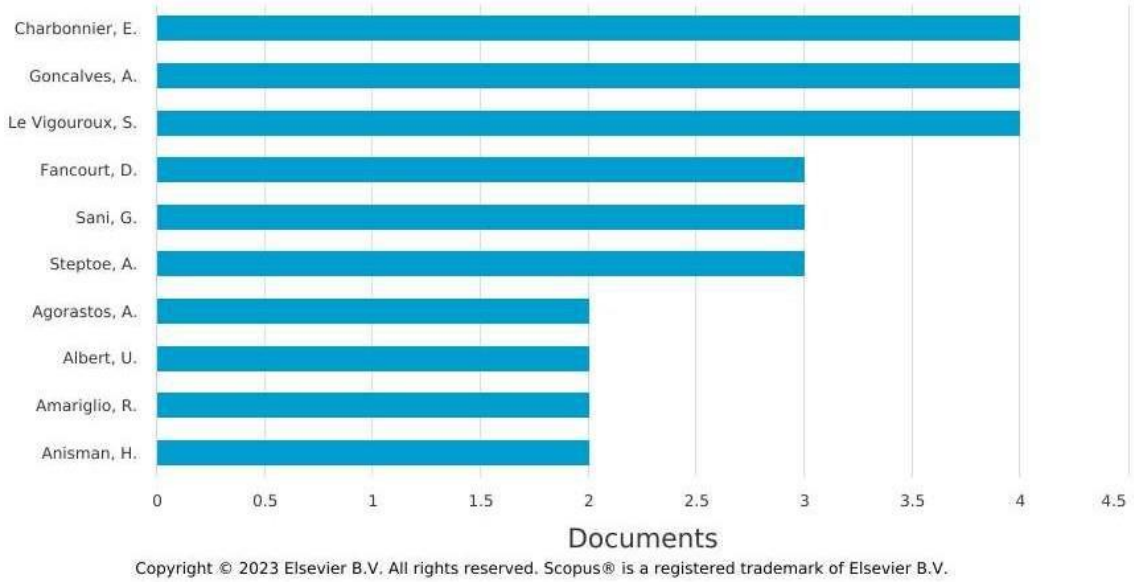
Figure 5: Countries with more than 10 Publications



4.1.7 Documents by Authors

The investigation uncovered the ten most prolific authors who made significant contributions to the Scopus database in relation to the subject matter of this study. Figure 6 shows that Charbonnier, E, Goncalves, A., Le Vigouroux, S., Fancourt, D., and Sani, G. were the top five authors.

Figure 6: Documents by Author



4.1.8 Funding Sponsorship

It takes sufficient financial and human resources, which are frequently in short supply, to sustain advancement in science and technology. Therefore, financing is essential for supporting research efforts (Aagaard et al., 2021). Sponsor funding often comprises stringent and extremely competitive methods, boosting the legitimacy of the study output (Morillo and Alvarez-Bornstein, 2018). As a result, research funded by grants typically has greater impact factors in terms of journal ranking and citation volume (Wand and Shapira, 2015). Government (including federal, state, and municipal institutions), profit-oriented organisations, and non-profit organisations are the three primary sources of research financing (McManus and Neves, 2021). The top five organisations that fund research and development in the field of mental health are shown in Table 7. The National Institutes of Health emerges as the most supportive institution, with 18 publications (5.07%), followed by the National Institute of Mental Health and the National Natural Science Foundation of China.

Table 7: Funding Sponsorship

1	National Institutes of Health	18	5.07
2	National Institute of Mental Health	11	3.10
3	National Natural Science Foundation of China	9	2.54

4	Eunice Kennedy Shriver National Institute of Child Health and Human Development	6	1.69
5	Canadian Institutes of Health Research	5	1.41

4.1.9 Leading Institutes

Table 8 provides an overview of the top 10 institutions at the forefront of research in the field of environmental disclosures. King's College London stands out with the highest number of publications, totalling 7 (1.97%). It is closely followed by Harvard Medical School, Università degli Studi di Milano-Bicocca, University College London, and Sapienza Università di Roma, each contributing 6 publications (1.69%) to the field.

Table 8: Funding Sponsorship

S. No.	Affiliation	No. of Publications	Percentage
1	King's College London	7	1.97
2	Harvard Medical School	6	1.69
3	Università degli Studi di Milano-Bicocca	6	1.69
4	University College London	6	1.69
5	Sapienza Università di Roma	6	1.69
6	Università degli Studi di Padova	5	1.41
7	University of Calgary	5	1.41
8	Université McGill	5	1.41
9	Karolinska Institutet	5	1.41
10	Universität Heidelberg	5	1.41

4.2 Network Analysis

4.2.1 Co authorship Analysis

For this the authors with minimum two publications has been taken as a threshold. Of the 2061 authors, 101 meet the threshold. The results shows that not much collaborative work is being done in this area. Largest set of connected items show 14 authors.

Figure 7: Co authorship Network

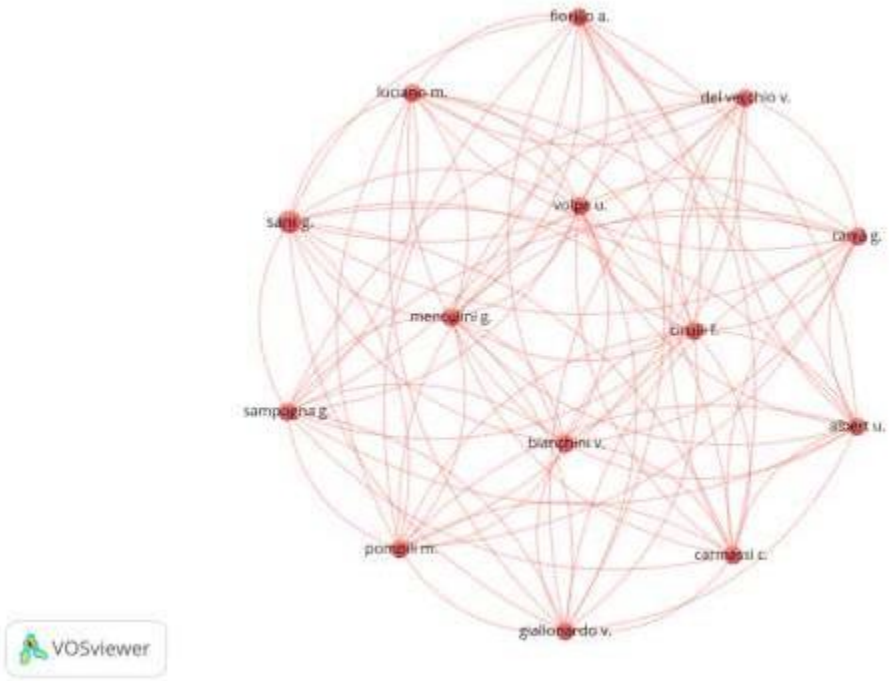
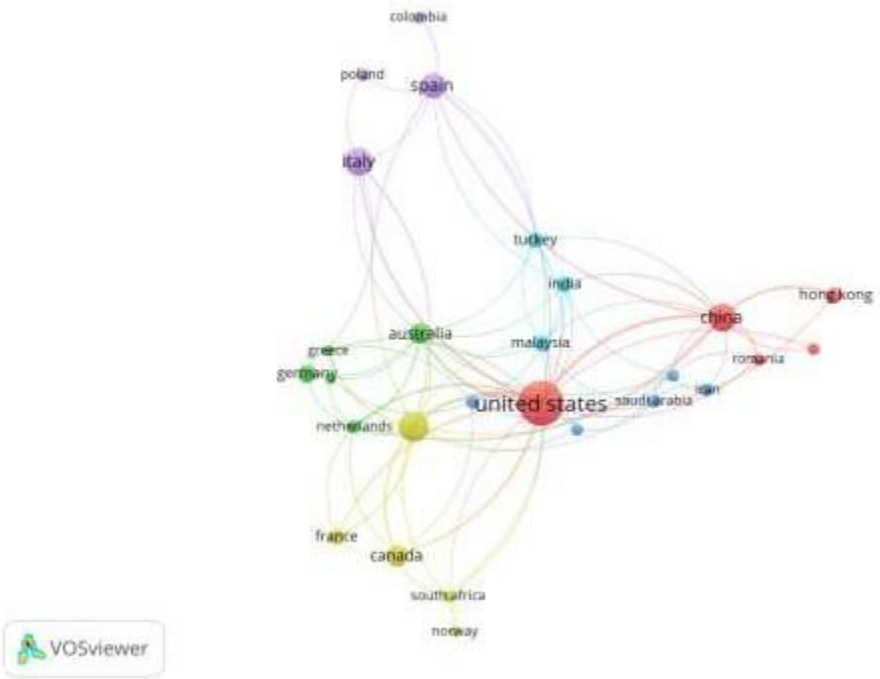


Figure 7 illustrates the interconnections between authors, focusing on co-authorship relationships. The study emphasizes the prominent collaboration among authors such as Albert U., Bianchivi V., Carmassi C., Carra G., Circulli F., and others in their academic endeavors.

4.2.2 Author Country Affiliation Analysis

The analysis included a country-wise examination of co-authorship, with a minimum threshold of five documents per country. Out of the 101 countries examined, 27 met the threshold criteria. Figure 8, shows that the UK, USA, China, and Australia rank highly in terms of research and development and collaborations with other countries. These countries are recognized for their impact on article quality, coverage, and overall influence. International cooperation with these nations is influenced by several variables, like the state of the global research environment, the resources available, and the amount of participation by universities, organisations, and people. Such partnerships enable the sharing of views, ideas, and experiences, eventually boosting competence in certain fields of study. (Low et al., 2014; Reddy et al., 2016).

Figure 8: **Author Country Affiliation Analysis**



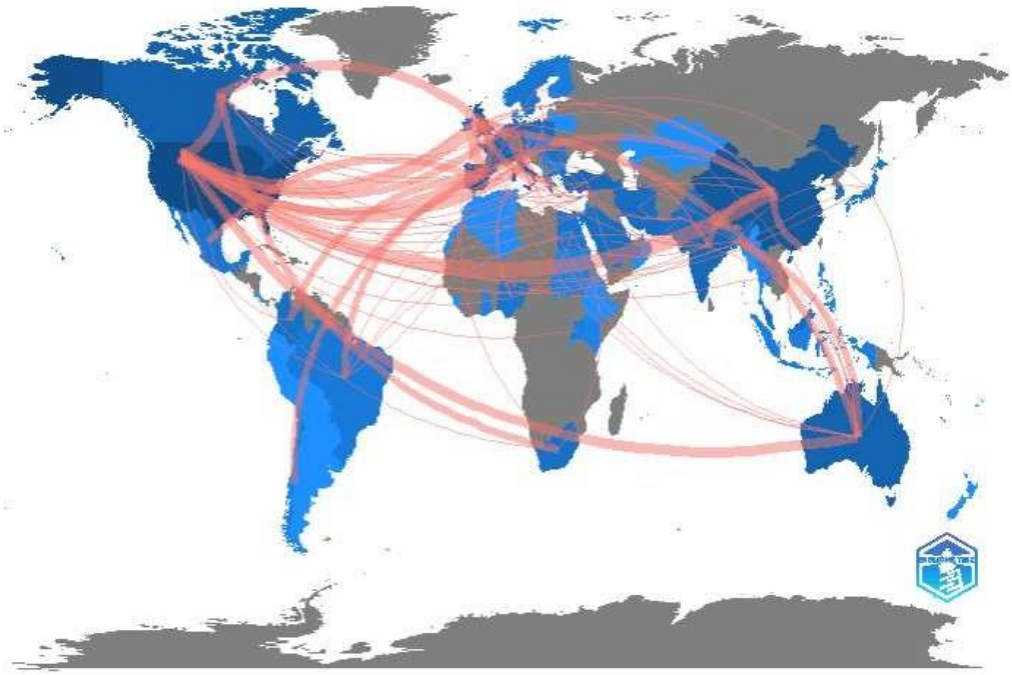
The findings presented in Figure 8 reveal that most authors in this research field are concentrated in developed nations, while there are relatively fewer authors from developing countries. The results show two main clusters: one comprising the United States, China, Hong Kong, South Korea, and Romania, and another consisting of Australia, Greece, Germany, the Netherlands, and the Russian Federation.

Notably, Indian researchers were found to be collaborating with researchers from Malaysia and Turkey, indicating specific research partnerships between these countries. This finding suggests a literature gap on the topic of study in developing countries. It also emphasises research partnerships between rich and developing nations from a different angle. For instance, whereas Pakistan works with Jordan, Iran, and Saudi Arabia, US collaborates with South Korea, Hong Kong, and China. Additionally, India collaborates with Malaysia, the United Kingdom collaborates with Canada, France, Norway, and Italy, and Columbia, Poland, and Spain collaborate with each other. Figure 9 depicts country collaboration map across globe.

These patterns of collaboration indicate the exchange of knowledge and expertise between different countries, with developed nations often engaging in research partnerships

with both developed and developing countries. However, it also highlights the need for increased research efforts and collaborations in developing countries to bridge the literature gap in this research area.

Figure 9. Country Collaboration Map



The importance of working with neighbouring nations is emphasised in the body of existing literature since geographic closeness can make it easier to create research networks (Darmadji et al., 2018). Language obstacles, logistical expenses, varied time horizons, and physical distance are all issues that affect international research collaboration in general. Globally, English is the most commonly used language of communication, especially in advanced research nations like the UK and the USA. However it is not widely spoken in Asian countries like China, Japan, or South Korea except for Australia and New Zealand. Collaboration attempts may be hampered by this linguistic barrier (Low et al., 2016).

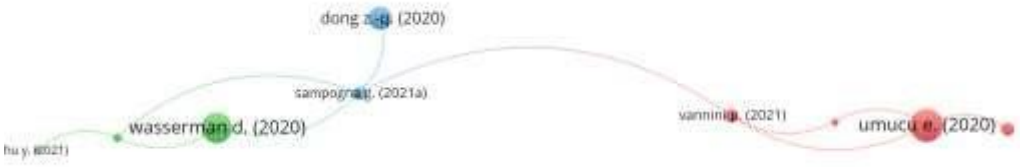
4.2.3 Citation Analysis

To understand the impact of work done in this area on upcoming researches, citation analysis has been done. It has been done from three angles namely document wise, author wise and country wise.

Citation Analysis: Document wise

To understand the effect of a work, citation analysis is done document wise. Taking minimum 5 citations per document, 155 out of 355 meet the threshold. Largest set of connected items is 9 and same is shown here (Figure 10). Work of Park et al (2020) on "Americans' COVID-19 Stress, Coping, and Adherence to CDC Guidelines" has got maximum 371 citations followed by Guo et al. (2020) on "Immediate psychological distress in quarantined patients with COVID-19 and its association with peripheral inflammation: A mixed-method study", and Wu W. (2020) on "Psychological stress of medical staffs during outbreak of COVID-19 and adjustment strategy" with 206, and 144 citations.

Figure 10. Citation Analysis: Document wise



Citation Analysis: Author wise

A threshold of a minimum of 10 citations per author was used for analysis. Out of the total 2061 authors, 657 met this criterion. Not all of these authors are connected to each other in terms of citations. The largest set of connected items consists of 9 items. The results (Figure 11) indicate that the work of Amaroglio, Sani G., Zhang L, and Zhang Y has received the highest number of citations.

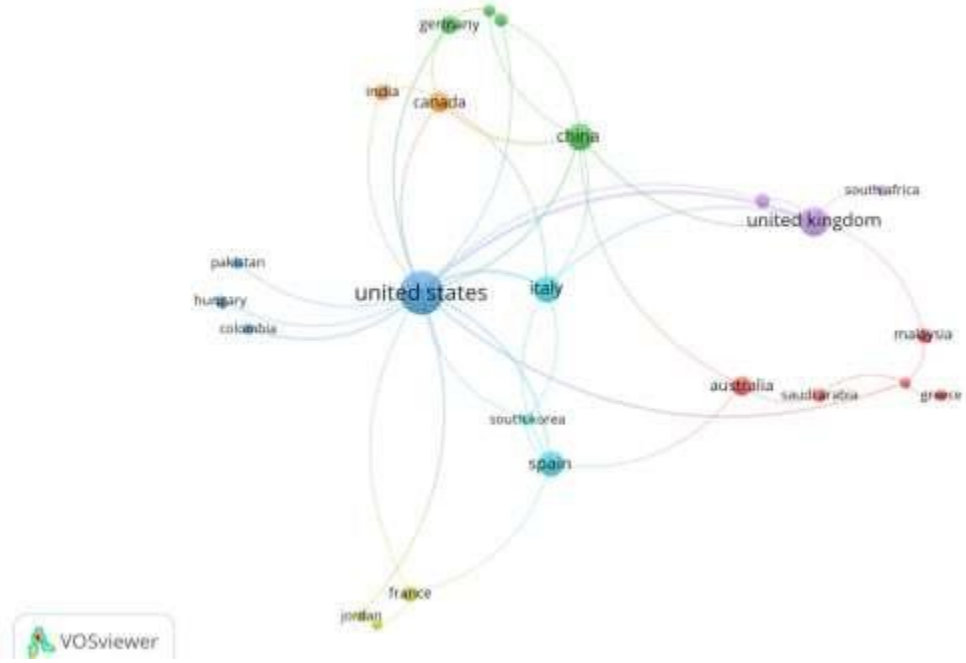
Figure 11. Citation Analysis: Author wise

Citation Analysis: Country wise

Using a threshold of a minimum of 5 documents per country, 27 out of the total 101 countries met the criteria for analysis.

The most cited work is primarily coming from the US, China, UK, Italy, and Spain. The largest set of connected items in terms of citations consists of 24 items, which is depicted in the figure 12.

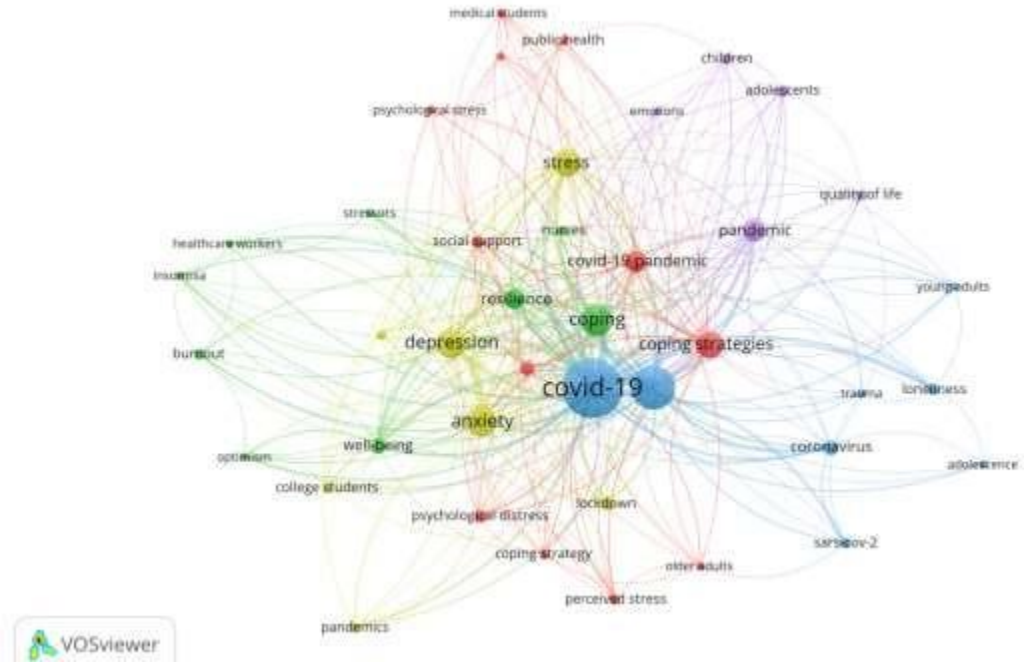
Figure 12: Country Wise Citation Analysis



4.2.4 Key Word Analysis

Taking minimum 5 occurrences of a key word as a threshold for the analysis, 41 out of total of 842 key words meet the criteria. Figure 7 visualized the most frequent author keywords. The prominent keywords utilized in the study include Covid-19, mental health, anxiety, depression, and stress, reflecting their significance in the research field. Stressors and adolescence rank among the network's least important keywords. This visualized network (Figure 13) highlights 5 clusters. Covid 19 has 427 links and 212 occurrences, whereas mental health has 111 occurrences and 286 links. The strength of the connection is shown through size of the circle and font. Different clusters are shown through different colours. For example, burnout, coping, healthcare workers, insomnia, nurses, optimism, resilience, stressors and well-being have the same light green colour to indicate the relationship. This network visualization offers valuable insights into potential research areas and directions.

Figure 13: Map Visualisation Network connecting to Author's Keywords



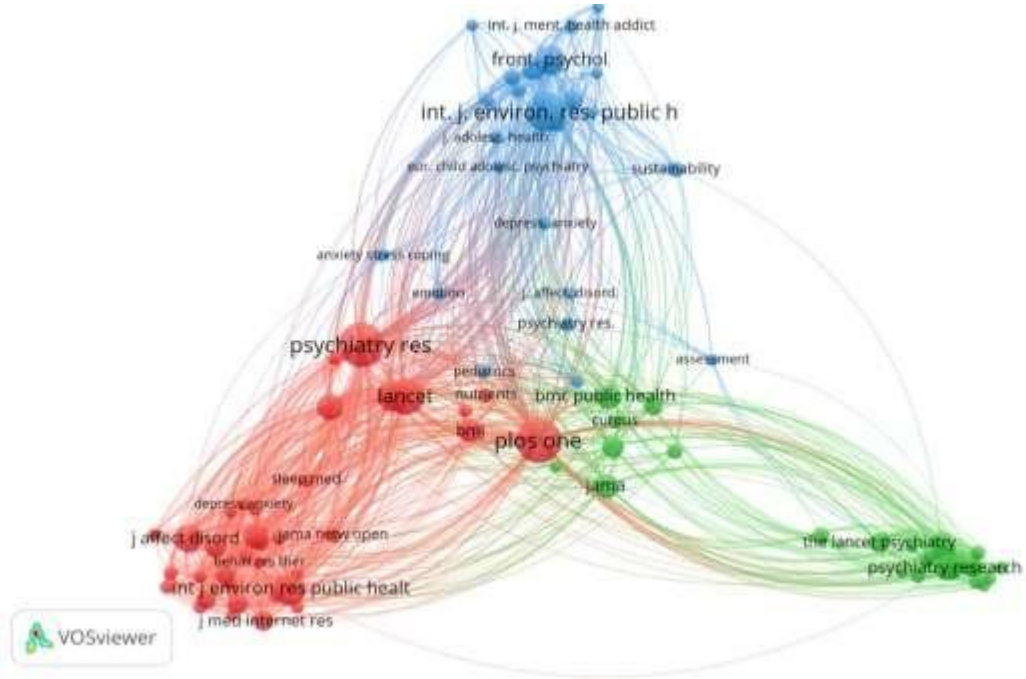
Most important key words have also been shown through the word cloud (Figure 14).

Figure 14: Word Cloud based on Key Words

4.2.5 Co-citation Analysis based on Sources

By setting a minimum citation threshold of 20 for each document, a total of 88 out of 7,436 sources were found to meet the criteria. The co-citation links with other sources were evaluated, and the sources with the highest link strength were identified. Figure 15 shows that Psychiatry Research journal emerged as the top source with 266 citations and a total link strength of 4,733. Plos One followed closely with a total link strength of 3,956 and 260 citations.

Figure 15: Co-citation Analysis based on Sources



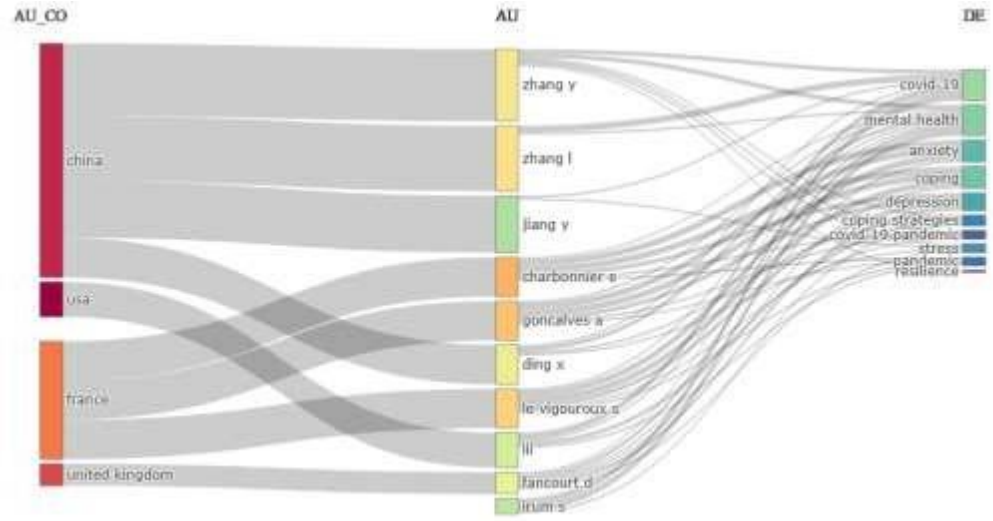
4.3 Analysis of Research on Environmental Accounting Disclosures and Upcoming Areas of Research

Overall research on “the effect of covid 19 on mental health and coping strategies” has been studied through three field plot and trending topic analysis.

4.3.1 Three Field plot (Sanky Diagram)

Three field plot assists in visualising main items in three fields such as authors, keywords, journals etc and how they are related to each other. In the present analysis, author country, authors and author key words have been analysed to examine their linkages. The Sanky diagram (Figure 16) reveals that major work on the topic comes from the China, USA, France and the UK. The main key words used in the research are covid 19, mental health, anxiety and stress.

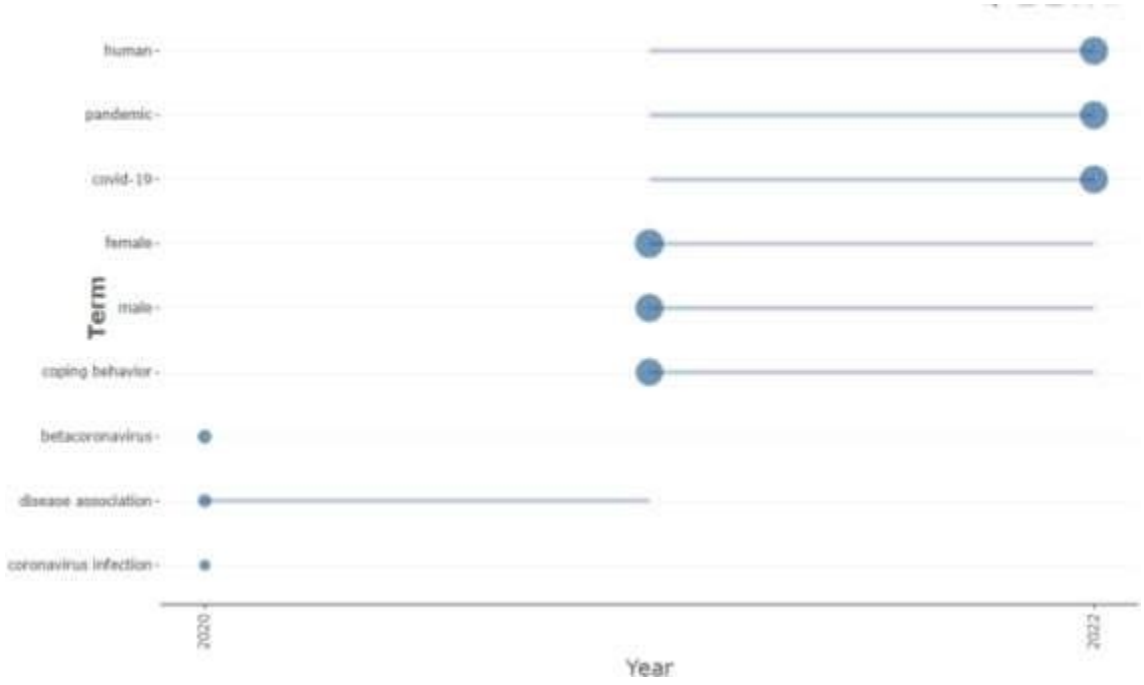
Figure 16: Sanky Diagram- Three Field Plot



4.3.5 Trending Topics Analysis

In addition, an examination of the trending topics based on the author's keywords was performed using specific parameters. The analysis considered a minimum frequency of 5 for each word, identified the top 5 words per year, and adjusted the label size accordingly. The findings (Figure 17) indicate that during the initial stages of the pandemic, research primarily centred on comprehending and studying the coronavirus itself. However, as time progressed, the focus shifted towards investigating the impact of the virus on both men and women.

Figure 17: Trending Topics



5. Summary and Conclusions

This study aims to examine and analyze the scientific output worldwide in the field of the effect of COVID-19 on the mental health and coping strategies. It provides a comprehensive review of the published research in this area, highlighting the increasing research efforts and the identification of techniques and methods employed by individuals and medical professionals to manage the mental health impact of COVID-19. Journal articles emerged as the primary source of research, indicating that a significant portion of the work is based on empirical evidence and verifiable data.

The findings reveal that the United Kingdom, United States, China, and Italy are major contributors in this research domain, demonstrating their commitment to addressing the global challenges posed by the pandemic. However, the analysis also suggests limited collaboration between researchers in different countries. Developed nations such as the UK, USA, China, and Australia rank highly in research and development and tend to engage in collaborations with other countries. This concentration of authors from developed nations indicates a literature gap in developing countries regarding this topic.

The most frequently used keywords in the literature include COVID-19, mental health, anxiety, depression, and stress. Interestingly, the least emphasized keyword in the network

analysis is "stressors and adolescence." Co-citation analysis further highlights that researchers from the United States, UK, China, Italy, and Spain have received significant attention in this field. These findings are corroborated by the Sanky diagram, which visually represents the relationships among the key contributors and their research focus.

Overall, this study sheds light on the current state of research in the area of COVID-19's impact on mental health and coping strategies. It underscores the need for greater collaboration and attention to be given to developing countries, while also highlighting the importance of addressing stressors and the mental health challenges faced by adolescents

Initially the focus of research was on understanding of Covid 19 and its causes, examination of virus and its medical treatment which later shifted to the study of differential effect of Covid 19 on mental health across diverse populations, and coping strategies and support mechanisms adopted by them. Concepts that have got more attention in this research area are covid 19, mental health, anxiety, and depression. Trending topic analysis based on authors' keywords confirms these findings. The work is exploratory in nature and provides base for undertaking structured literature review based on shortlisted papers and the same can be used to document various methods employed by people to tackle mental health problems. In fact, there is a need for such study so that in future we are ready for such issues.

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