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SCIENTIFIC MAPPING OF CLIMATE CHANGE AND MENTAL HEALTH: A SCIENTOMETRIC ANALYSIS

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Abstract: *The present study conducted a comprehensive examination of the body of literature about the domain of climate change and mental health. This investigation used empirical data and scientometric approaches to analyse the subject matter in detail. A thorough analysis was conducted on a large dataset consisting of more than 1353 scholarly publications in order to investigate and understand the current trends within this academic field. The Web of Science Core Collection (WoS) was used as the primary tool for identifying and examining important characteristics, such as publishing trends, citation behaviours, significant academic works, and notable terminology. Significantly, the data revealed significant participation from a wide range of 113 nations and areas in the field of climate change and mental health research. Over a period of time, noticeable patterns emerged indicating a significant increase in the level of publishing activity, with the United States, Australia, and England emerging as the primary contributors. This study has identified a group of 4,768 writers who have made major advancements to the development of this discipline. Significantly, the term "suicide" surfaced*

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as one of the most significant keywords inside the corpus. Also, the emergence of thematic keywords such as "green space" and "place" highlights the need for greater research funding and the utilisation of innovative methodologies to stimulate the creation of novel scholarly contributions in the field of climate change and mental health.

Keywords: *Scientometrics, Climate Change, Mental Health, WoS*

Introduction

The impact of climate change on mental health and overall well-being is a multifaceted and often overlooked phenomenon. The influence of climate change on human health becomes conspicuous through alterations in climate patterns, resulting in heightened frequencies and increased severity of extreme weather events such as heatwaves, wildfires, floods, droughts, and storms. These changes exert profound effects on mental health and overall well-being, encompassing an individual's subjective experiences of mood, emotion, life satisfaction, and self-realization. A substantial body of research supports the multifaceted nature of these consequences (see, for examples, Alibudbud (2023), Kauhanen et al. (2023) and Stanley et al. (2021)), reflecting their intricate manifestation within complex systems (Berry et al., 2018).

These repercussions span a wide spectrum of psychological afflictions, including mood disorders such as depression, tendencies towards self-harm, anxiety disorders, and post-traumatic stress disorders. Additionally, emotional distress characterized by feelings of hopelessness, sadness, frustration, and anger is prevalent. Furthermore, climate change exacerbates pre-existing severe mental illnesses like psychosis. The impact extends to various psychological dimensions, including heightened general apprehension, discomfort, diminished existential security, and disruptions in one's sense of self and attachment to specific geographic locations (Devine-Wright et al., 2015).

To capture these effects, various terms have been introduced, including "eco-anxiety", "climate anxiety", and "pre-traumatic stress" (Hogg et al., 2023). Importantly, these repercussions are not limited to individuals directly affected by catastrophic weather-related events but have a global reach (Clayton, 2020). The correlation between climate change and various psychiatric disorders, including Posttraumatic Stress Disorder, Major Depressive Disorder, Generalised Anxiety Disorder, Substance Use Disorders, and suicide rates, has been documented in previous research (Sri et al., 2023). For example, preliminary results from an extensive scoping assessment indicate that an increase of 1°C in temperature may be associated with a corresponding 7% increase in the prevalence of Major Depressive Disorder (Charlson et al., 2021). Moreover, a recent global study conducted by Hickman et al. in 2021 has unveiled a noteworthy trend: a substantial percentage of children and adolescents, specifically exceeding 45%, have articulated their apprehensions regarding the detrimental impacts of climate change on their day-to-day existence. The World Health Organisation, in its statement released in 2022, has issued a call to action for mental health practitioners to actively participate in tackling the negative mental health outcomes resulting from the impacts of climate change. Moreover, as we anticipate future climatic changes, it becomes evident that these consequences are poised to escalate (Pörtner et al, 2022). Thus, the impact of climate change on mental health and general well-being is a crucial and worthy topic that requires comprehensive investigation and scientific examination.

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Remarkably, a significant gap exists in the scholarly landscape, a comprehensive scientometric analysis of research regarding the confluence of climate change and mental health has yet to be undertaken. Consequently, the primary objective of this study is to address this void by delving into the aforementioned subject matter. This research employs scientometric analysis as its methodological approach, a systematic framework for collecting, organizing, and analyzing scientific literature and publications. This method affords a comprehensive understanding of the evolving landscape, uncovering valuable insights, patterns, and advancements that might otherwise remain obscured (Azra et al., 2022). To facilitate the examination of climate change and mental health studies through scientometrics, a range of software tools has been leveraged, including CiteSpace, VOSviewer, ScientoPia, and HistCite, (Li et al., 2022).

This study endeavors to address a series of pivotal inquiries, including: (i) What are the prevailing publication patterns within this domain? (ii) Who constitutes the primary knowledge contributors in this field? (iii) Which subjects garner the most attention and how have their trajectories evolved over time? (iv) What notable publications and keywords emerge as significant? Through an in-depth exploration of these concerns, this study aims to provide helpful insights for future studies, while also illuminating the significant issues that underpin the domain of climate change and mental health.

Methodology

For this study, access to the Web of Science Core Collection (WOSCC) database was instrumental in locating pertinent literature concerning the intersection of climate change and mental health. The search was executed on August 30th, 2023, and the specific query can be accessed at the following URL:https://www-webofscience-com.ezaccess.library.uitm.edu.my /wos/woscc/analyze-results/a9187aba-0877-43f9-9356- 25273d41956f-a06d1ef2. To conduct the analysis and organization of the acquired dataset, CiteSpace was utilized, a scientometric analysis tool, in conjunction with Microsoft Excel 2019. A visual representation of the methodology employed in our literature search is provided in Figure 1. Throughout this process, various techniques inherent to CiteSpace were applied, encompassing centrality analysis, burst detection, co-citation analysis, and sigma score calculation. Comprehensive definitions and in-depth explanations of these analytical concepts can be accessed on the official CiteSpace webpage, which is available at the following link: (https://citespace.podia.com/glossary).

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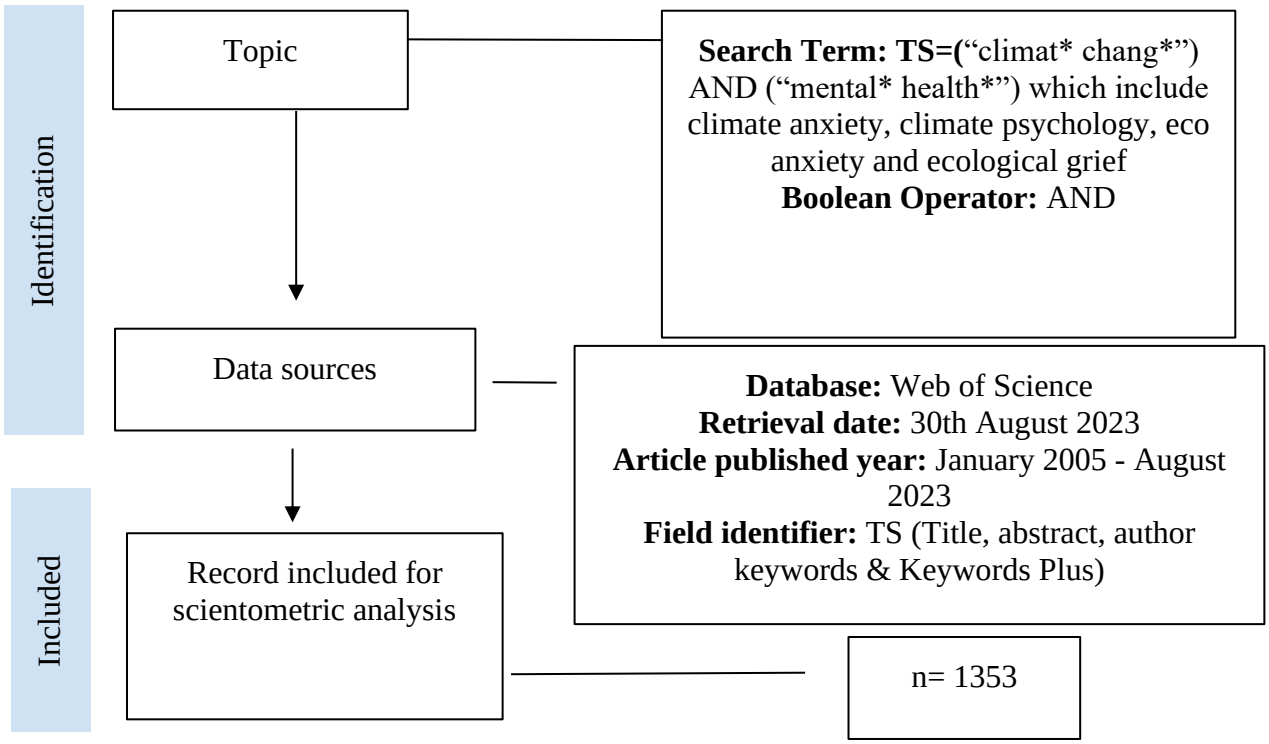

Figure 1: The flowchart or also known as methodological framework of the present study on climate change and mental health.

Results

Descriptive statistics

Number of publications

The scope of this investigation encompassed scholarly articles published from January 2005 to August 2023, as visualized in Figure 2. Over this designated timeframe, a cumulative total of 1353 articles were collected. Notably, a notable and consistent upward trajectory in publication numbers became evident starting in 2016, culminating in a total of 1206 articles generated during the period spanning from 2016 to 2023. This observed trend underscores a growing proclivity and heightened scholarly attention within the scientific community towards the intricate interplay between climate change and mental health. It underscores the multifaceted implications this connection can have on human lives, emphasizing the increasing recognition of its significance.

Top Prolific Authors

Commencing in 2005, there has been a substantial surge in the volume of publications addressing the nexus of climate change and mental health, as visually depicted in Figure 3. Among the extensive roster of authors, a noteworthy group of 27 individuals have made significant contributions, each authoring more than 5 publications. Within the extensive community of 4,768 authors, a notable 665 (13.95%) have contributed more than one article to this field. Helen L Berry and Ashlee Cunsolo emerge as standout figures, boasting the highest number of publications, each having contributed 18 papers. In close proximity, Sherilee Harper follows with 17 publications to her credit. These prolific authors have made substantial strides in advancing our comprehension of the intricate relationship between climate change and mental health.

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Top Institutions

Figure 4 presents the top ten institutions, ranked by their total publications in the realm of climate change and mental health. Amidst the 1965 institutions contributing to this subject area, the University of London stands out as the most prolific, having contributed 65 publications. It is closely pursued by the Australian National University with 49 publications and the University of Sydney with 47 publications. Together, these leading ten institutions, with a combined total of 412 publications, significantly contribute to the enrichment of collective knowledge within this field.

Top Prolific Journals

Figure 5 highlights the top ten journals based on their publication volume within the field of climate change and mental health, encompassing a review of 661 journals. The International Journal of Environmental Research and Public Health emerges as the leading journal with the highest publication count, featuring 88 articles. Closely following are Sustainability and BMC Public Health with 34 and 23 publications, respectively. Over the timeframe from 2005 to 2023, these top ten journals collectively disseminated 257 articles, underscoring their significance as influential platforms for the dissemination of research within this domain.

Top Regional Distribution

Figure 6 provides a comprehensive analysis of articles published in the realm of climate change and mental health research, originating from 113 different nations. The United States of America takes the lead in publication output, amassing a substantial total of 448 articles. Australia secures the second position with a considerable margin, contributing 292 publications. England, meanwhile, occupies the third position with 219 publications. These nations have played a pivotal role in influencing research within this field, underscoring their significance and proactive engagement in addressing climate change and concerns related to mental health.

Top Publishers

Figure 7 depicts the number of publications released between 1991 and 2023 by the top ten publishers, collectively contributing to 74.72% of the total publications. This underscores their substantial engagement in addressing the crucial issue of climate change's impact on mental health. Prominently featured among these publishers is Elsevier, leading the list with 246 publications, closely followed by Springer Nature with 182 publications and MDPI with 150 publications. This highlights the profound commitment of these publishers to disseminating research concerning the intricate relationship between climate change and mental health dynamics. Such collective dedication to publishing articles in this domain plays a significant role in the dissemination of knowledge and holds the potential to influence policy decisions.

Top Research Area and Citation Topic Micro

A total of 63 distinct research domains have been identified, with the top ten categories detailed in Table 1. Notably, Environmental Sciences contribute to 455 scholarly works, while Public Environmental Occupational Health and Psychiatry account for 344 and 198 research publications, respectively. This statistical prominence underscores the appeal and significance of these specific research domains, capturing the attention of researchers. Furthermore, Table 1 presents primary micro-level citation topics, with heat waves being the most prevalent, featuring in 510 publications. In contrast, the topic of Climate Change Adaptation is represented by 111 publications, while Post-traumatic stress disorder (PTSD) follows with 63 publications. These patterns in citation preferences reveal the enduring significance of mental health-related matters, particularly concerning their vulnerabilities induced by climate change. The prevalence

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of studies related to heat waves emphasizes the urgent need to scrutinize their impact on mental health.

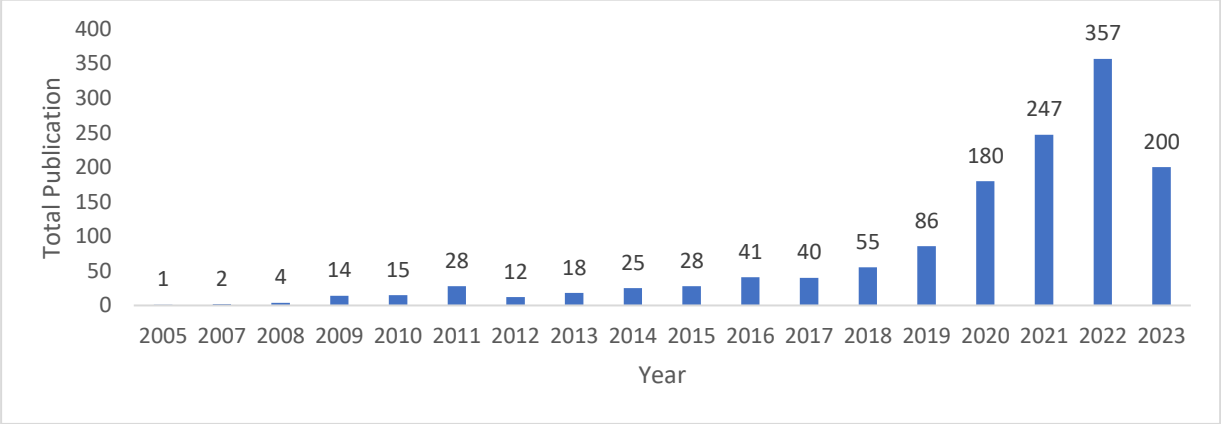

Figure 2: Number Of Research Articles Published Annually Between 2005 To 2023.

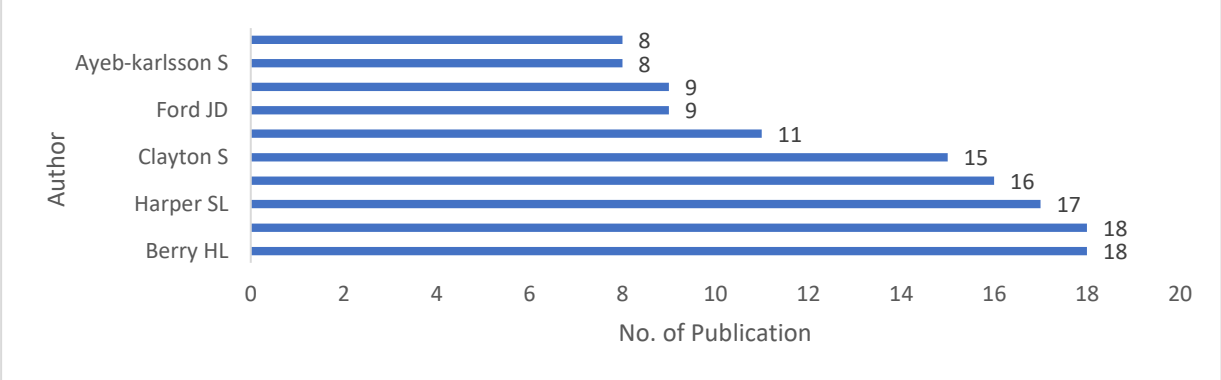

Figure 3: Top Ten Most Prolific Authors For The Period 2005 To 2023.

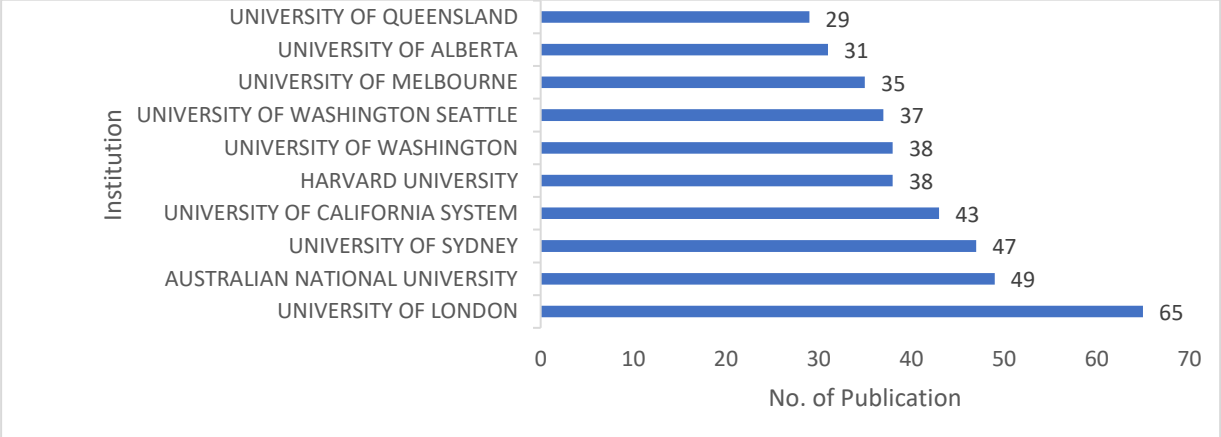

Figure 4: Number Of Publications From The Top Ten Of 1965 Institutions.

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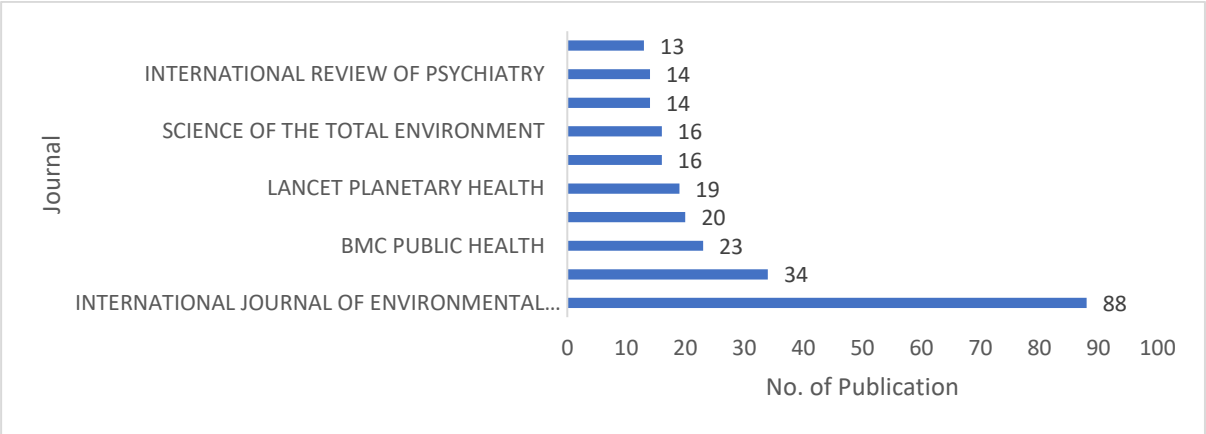

Figure 5: Number Of Publications Published Between 2005 And 2023 From The Top Ten Journals.

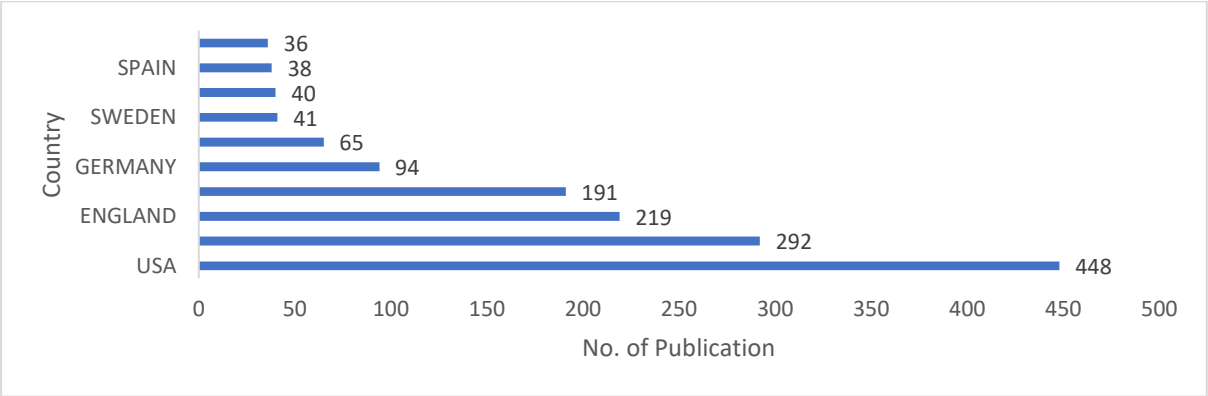

Figure 6: Number Of Publications Published From 2005 To 2023 From The Top Ten Country/Region.

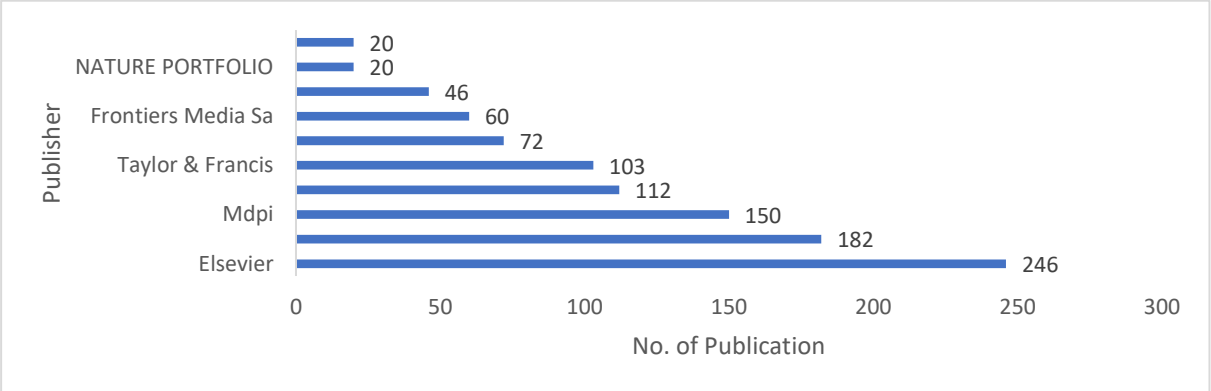

Figure 7: Number Of Publications Published Between 1991 And 2023 From The Top Ten Publishers.

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Table 1: Top 10 Research Areas and Citation Topics Micro in the fields of climate change and mental health for period 1991-2023.

Research Areas	Record Count	Citation Topics Micro	Record Count
Environmental Sciences Ecology	455	Heat Waves	510
Public Environmental Occupational Health	344	Climate Change Adaptation	111
Psychiatry	198	Ptsd	63
Psychology	173	Place Attachment	55
Science Technology Other Topics	96	Environmental Concern	32
Meteorology Atmospheric Sciences	79	Science Communication	29
Pediatrics	46	Suicide	20
Nursing	43	Anthropocene	20
General Internal Medicine	40	Self-rated Health	14
Education Educational Research	39	Air Pollution	13

Scientometric analysis

Dual-map Overlay

Figure 8 provides a dual map overlay study that illustrates the most prolific disciplines engaged in climate change and mental health research (on the left side) and the intellectual subfields within these domains (on the right side). On the left side, the nodes represent articles within the domain, while on the right side, the nodes represent articles referenced by those on the left. The thickness of the lines connecting the nodes indicates the number of citations, with thicker lines denoting a higher citation count. The ellipsoids on the right side depict the number of active citations and journals in the field of climate change and mental health research. Larger ellipsoids signify more dynamic intellectual landscape domains. A shift in trajectory suggests that publications from one field have influenced papers from another.

According to this study, research in the area of climate change and mental health spans a diverse range of disciplines, with notable emphasis on economics, politics, psychology, education, and health (Figure 8, left side). Additionally, when examining the referenced publications (Figure 8, right side), it becomes evident that psychology, education, social sciences, health and nursing, economics, and politics dominate the intellectual subfields, making substantial contributions to the academic discourse on climate change and mental health.

This study underscores the multidisciplinary nature of research in this subject, highlighting the importance of various disciplines in advancing our understanding of the intricate issues surrounding climate change and mental health. Psychology, education, social sciences, health and nursing, economics, and politics all play pivotal roles in shaping the research landscape, and their influence is reflected in the literature through a preponderance of citations from these fields.

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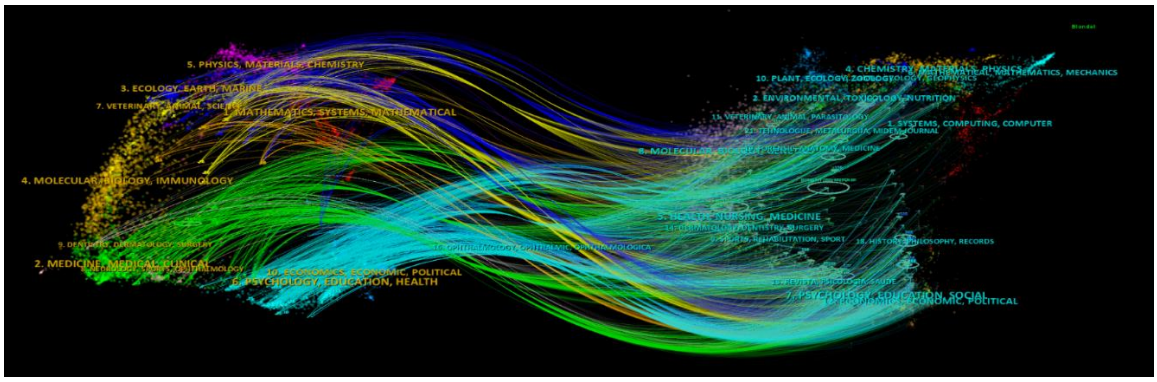

Figure 8: Dual Map Overlay For Climate Change And Mental Health Research In The World.

Co-citation analysis

Co-citation analysis is a robust method that constructs a scientific map featuring nodes, links, and density values. This methodology aids in comprehending the fundamental structure and its evolution over time. Within the realm of climate change and mental health, co-citation analysis unveils interconnections and influential relationships between articles. The visualization of these networks exposes emerging research domains within the field of climate change and mental health studies. Below are the co-citation findings for articles.

Document cluster analysis

The Document Cluster Analysis reveals consistent and cohesive network properties, as evidenced by a Modularity Q Index of 0.7461, a Weighted Mean Silhouette measure of 0.8999, and a Harmonic Mean (Q, S) of 0.8158. Figure 9 presents a document cluster network map, wherein each node represents an institution, and the yellow lines connecting them depict citation-based partnerships. The map exclusively includes documents with a centrality score exceeding 0.1 for precision. The analysis identifies a total of 14 co-citation clusters, with 12 notable clusters depicted in Figure 10. Each cluster is delineated by a solid yellow line, labeled on the right side, and ordered by size. The cluster labels were generated using text mining and keyword analysis within the CiteSpace program, employing the loglikelihood ratio (LLR) for cluster naming.

Table 2 provides an overview of the top ten primary clusters revealed by the Document Cluster Analysis, each representing a distinct research domain. The size of each cluster corresponds to the number of articles it encompasses. The most substantial clusters include "practical suggestion" with 134 publications, "ambient temperature" with 111 publications, and "farmer distress" with 98 publications.

Silhouette scores across the clusters range from 0.832 to 0.981, indicating a very high degree of similarity among articles within each cluster. These findings underscore the well-defined research themes identified through the Document Cluster Analysis, with each cluster elucidating a different facet of climate change and its interrelation with mental health.

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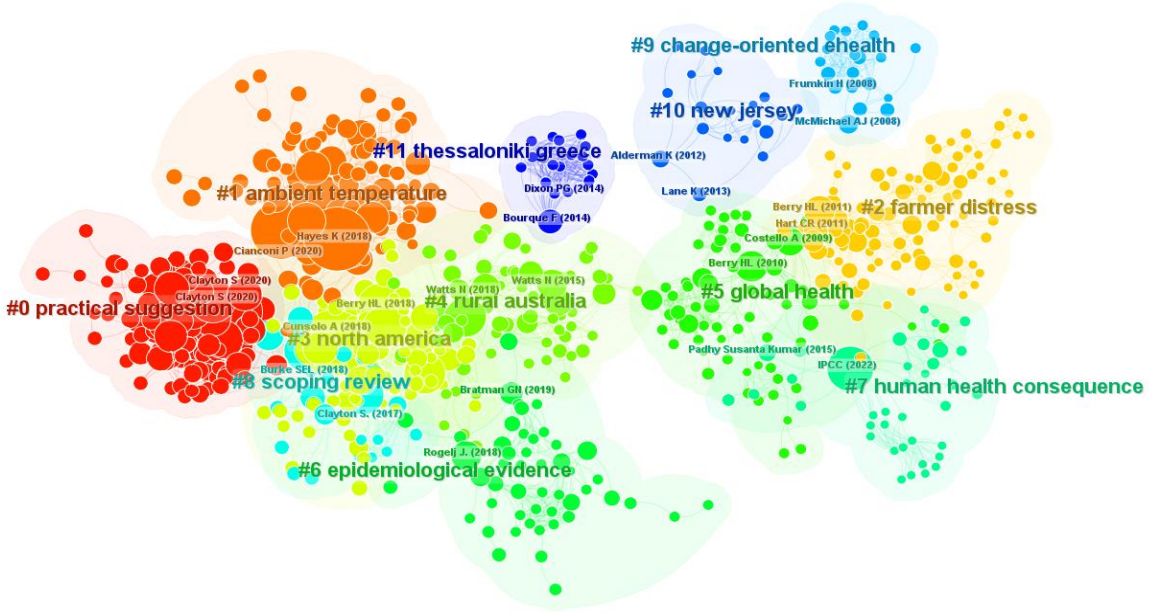

Figure 9: Network of Document Co-citation analysis.

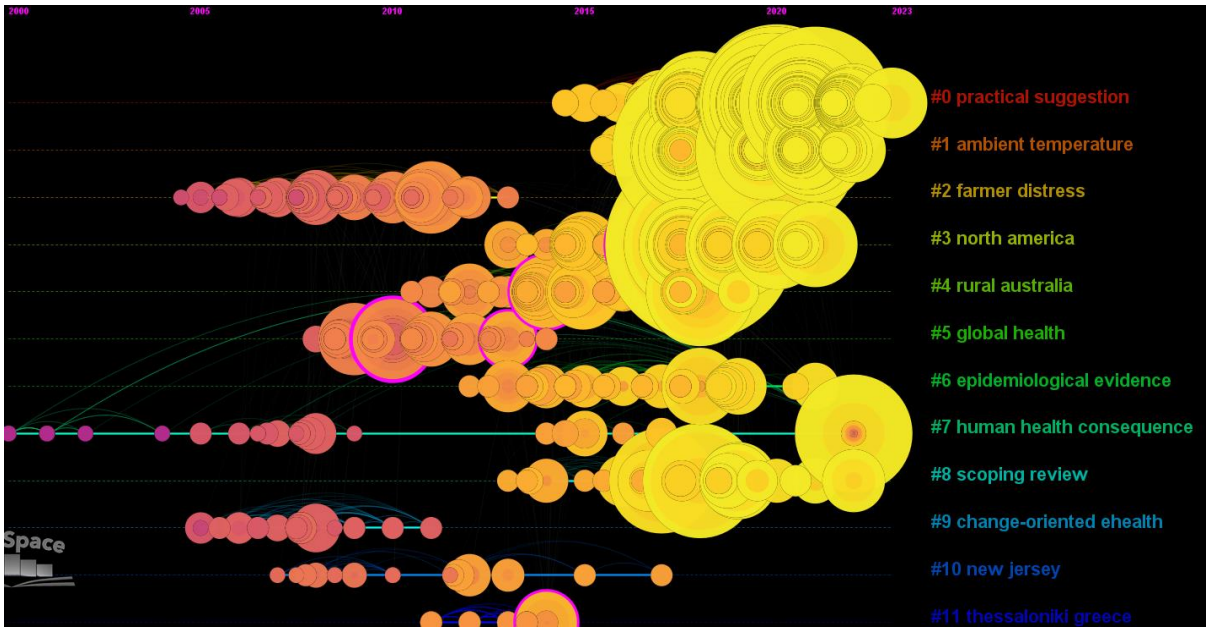

Figure 10: Summary Of Identified Document Cluster Lifetimes (Solid Lines). Cluster Labels Were Generated From Citespace.

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Table 2: Ten (10) Major Cluster emerged from Document Co-citation Analysis.

ClusterID	Size	Silhouette	Label (LLR)	Label (MI)	Average Year
0	134	0.904	practical suggestion (201.48, 1.0E-4)	adaptation pathway (1.4)	2019
1	111	0.837	ambient temperature (273.05, 1.0E-4)	adaptation pathway (2.34)	2019
2	98	0.922	farmer distress (181.28, 1.0E-4)	mental health (0.07)	2008
3	92	0.832	north america (297.11, 1.0E-4)	adaptation pathway (2.43)	2017
4	68	0.84	rural australia (243.1, 1.0E-4)	adaptation pathway (0.58)	2014
5	67	0.955	global health (143.68, 1.0E-4)	mental health (0.08)	2011
6	49	0.939	epidemiological evidence (294.3, 1.0E-4)	new insight (0.21)	2016
7	37	0.957	human health consequence (167.36, 1.0E-4)	mental health (0.07)	2006
8	26	0.937	scoping review (190.83, 1.0E-4)	health hazard (0.49)	2017
9	20	0.981	change-oriented ehealth (61.95, 1.0E-4)	mental health (0.11)	2007

Burst analysis

To identify influential or pivotal publications and noteworthy keywords, a burst analysis was conducted. This analysis assists in detecting emerging trends and significant advancements within the climate change and mental health domain. The resulting trends in studies and keywords are as follows:

Document burst.

Table 3 provides an overview of the top ten publications with the highest citation bursts, along with their respective burst durations in the rightmost columns. A burst signifies the emergence of a keyword in a publication during a specific timeframe. The blue line on the chart illustrates the chronological span from 2005 to 2023, while the red line indicates the burst period.

Notably, the most recent burst is associated with the article titled "The 2019 report of The Lancet Countdown on health and climate change: ensuring that the health of a child born today is not defined by a changing climate." This publication exhibited a burst strength of 10.4, commencing in 2019 and persisting until 2021. Published in The Lancet journal in 2019, this research presents an annual update of 41 indicators across five key domains: climate change impacts, exposures, and vulnerability; adaptation, planning, and resilience for health; mitigation actions and health co-benefits; economics and finance; and public and political engagement.

Furthermore, the paper titled "Climate Change and Mental Health: A Causal Pathways Framework" registered the highest burst strength at 17.52. Published in 2009, this influential publication proposes that various aspects of climate change may impact mental health through direct and indirect pathways, potentially leading to severe mental health issues, including an increased risk of suicide mortality.

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Top 10 References with the Strongest Citation Bursts

References	Year	Strength	Begin	End	2005 - 2023
Berry HL, 2010, INT J PUBLIC HEALTH, V55, P123, DOI 10.1007/s00038-009-0112-0, DOI	2010	17.52	2010	2015	
Costello A, 2009, LANCET, V373, P1693, DOI 10.1016/S0140-6736(09)60935-1, 10.1016/S0140-6736(09)60929-6, DOI	2009	13.37	2010	2014	
Berry HL, 2011, ASIA-PAC J PUBLIC HE, V23, P119S, DOI 10.1177/1010539510392556, DOI	2011	14.95	2011	2016	
OBrien LV, 2014, ENVIRON RES, V131, P181, DOI 10.1016/j.envres.2014.03.014, DOI	2014	12.79	2015	2019	
Watts N, 2015, LANCET, V386, P1861, DOI 10.1016/S0140-6736(15)60854-6, DOI	2015	11.86	2015	2020	
Fernandez A, 2015, PLOS ONE, V10, P0, DOI 10.1371/journal.pone.0119929, DOI	2015	12.06	2017	2020	
Clayton S., 2017, MENTAL HLTH OUR CHAN, V0, P0	2017	12.52	2018	2021	
Berry HL, 2018, NAT CLIM CHANGE, V8, P282, DOI 10.1038/s41558-018-0102-4, DOI	2018	11.74	2019	2021	
Cunsolo A, 2018, NAT CLIM CHANGE, V8, P275, DOI 10.1038/s41558-018-0092-2, DOI	2018	11.45	2019	2021	
Watts N, 2019, LANCET, V394, P1836, DOI 10.1016/S0140-6736(19)32596-6, DOI	2019	10.4	2020	2021	

Figure 11: Top Ten References With Strongest Citation Burst.

Keyword burst.

Table 4 provides an overview of keywords exhibiting the most citation bursts, indicating emerging trends and focal areas of research within the context of climate change and mental health. A burst signifies the prevalence of a term in publications related to a specific topic over a defined timeframe. The blue line on the chart represents the timeline from 2005 to 2023, while the red line indicates the burst period.

Surprisingly, among the keywords, "suicide" registered the highest burst strength, scoring 8.49 during the interval from 2010 to 2018. Noteworthy keywords such as "Australia" (burst strength: 5.21, 2010-2019) and "climate-change" (burst strength: 3.82, 2012-2019) also displayed robust bursts, indicating focused attention and burgeoning trends within their respective burst periods. These findings shed light on the evolving interests and prominent areas of exploration in the domain of climate change and mental health.

Table 5, on the other hand, presents frequently occurring terms in the titles, abstracts, and keywords of publications. The term "climate change" stands out, appearing 658 times as the most prevalent keyword. Following closely, "mental health" appears 495 times, and "impact" follows with 118 occurrences. These keyword analyses offer valuable insights into prevailing research trends and crucial focal points within the realm of climate change and mental health studies, highlighting a spectrum from novel concerns to extensively researched concepts within the field.

Top 10 Keywords with the Strongest Citation Bursts

Keywords	Year	Strength	Begin	End	2005 - 2023
suicide	2010	8.49	2010	2018	
australia	2010	5.21	2010	2019	
climate-change	2012	3.82	2012	2019	
drought	2010	6.07	2013	2018	
community	2009	4.89	2013	2016	
new south wales	2014	3.63	2014	2020	
mental-health	2011	4.45	2015	2019	
green space	2018	4.42	2018	2021	
nunatsiavut	2018	3.99	2018	2020	
place	2019	4.12	2020	2021	

Figure 11: Top Ten Keyword With Strongest Citation Burst.

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Table 5: Top ten keyword with highest frequency.

Frequency	Keyword	Year
658	climate change	2007
495	mental health	2007
118	impact	2011
97	impacts	2012
88	mortality	2008
88	risk	2008
86	health	2009
75	adaptation	2011
71	mental-health	2011
68	vulnerability	2009

Discussion

The objective of this study was to conduct a scientometric analysis of research within the climate change and mental health domain. A descriptive investigation encompassed critical attributes, such as the quantity of publications, the journals of publication, the authors, the universities or institutions affiliated with the authors, and the countries or regions associated with these authors. This comprehensive analysis aimed to provide insights into overarching publication trends.

A consistent upward trajectory in the number of publications each year spanned almost two decades, with an average of 75 papers annually. Notably, starting from 2016, the publication output exceeded 40 papers per year, signifying a substantial surge in research activities in recent years. The increasing number of papers addressing the relationship between climate change and mental health holds additional significance due to the intricate nature of this study topic and the associated challenges.

This trend is a strong indication of the growing interest, heightened recognition, and increased scientific engagement in the field of climate change and mental health research. Despite the inherent challenges inherent to this complex domain, the persistent increase in scholarly productivity underscores the determination to comprehend the intricate connections between these pivotal variables and their broader implications. The observed upward trend not only reflects the dedication of researchers and institutions but also underscores the urgent imperative to comprehend and address the complex interplay between climate change and mental health.

The fourth research question aimed to identify the predominant subjects and clusters within the field of climate change and mental health, along with the temporal evolution of these topics and clusters. Document cluster analysis revealed a total of 14 co-citation clusters. Among these, the most significant clusters are "practical suggestion," "ambient temperature," and "farmer distress." These findings highlight a substantial focus of research on investigating the impact of climate change and offering practical suggestions and policy implications. The emergence of "farmer distress" as a prominent cluster is noteworthy, suggesting that a significant body of research is dedicated to understanding the mental health challenges faced by farmers in the context of climate change. This finding underscores the vulnerability of the farming community to the mental health impacts of climate change, making it a critical area of study within the broader field.

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The examination of document bursts uncovered a noticeable pattern of expanding research topics, with recent publications gradually surpassing older ones. Interestingly, the results of burst analysis displayed some disparities compared to the document co-citation analysis. Notably, seven (7) out of the top ten keyword burst scores were associated with older publications published before 2015. However, throughout the timeframe spanning from 2005 to 2023, terms like "climate change" and "mental health" consistently maintained their significance in both burst and frequency analyses. This underscores their enduring prominence in the discourse surrounding climate change and mental health.

The significant difference between co-citation and burst scores highlights the critical need to broaden the scope of study focus. Furthermore, the emergence of new keyword burst trends such as "green space" and "place" accentuates the urgency for additional funding or the adoption of innovative methodologies to facilitate a greater influx of scientifically original research articles in the field of climate change and mental health studies. These burgeoning trends underscore the persistent requirement for ongoing inquiry and exploration to effectively address the escalating challenges and opportunities within this evolving field.

Conclusions

This study provides a comprehensive overview of the field of climate change and mental health research, although it acknowledges potential limitations. These limitations include the possibility of publication bias due to the use of the Web of Science (WOS) database and the potential inclusion of unrelated subjects resulting from the CiteSpace software.

The study underscores the importance of enhanced international collaboration to address the effects of climate change and achieve the 2030 Sustainable Development Goals (SDGs). It emphasizes the significance of interdisciplinary research and cooperation while identifying critical research gaps and suggesting future directions.

It is worth noting that the study's findings may be influenced by the choice of the database. To address this limitation, further exploration and the inclusion of a wider range of literature sources are essential to bridge these gaps and enhance understanding in the vital field of climate action and mental health investigation.

References

Alibudbud, R. (2023). Mental Health Service, Training, Promotion, and Research during Typhoons: Climate Change Experiences from the Philippines. Asian Journal of Psychiatry, 103673.

Azra, M. N., Noor, M. I. M., Sung, Y. Y., Dawood, M. A. O., and Ghaffar, M. A. (2022). Trends and developments in thermal tolerance: a scientometric research study. J. Thermal Biol. 106, 103234. doi: 10.1016/j.jtherbio.2022.103234

Berry, H. L., Bowen, K., & Kjellstrom, T. (2010). Climate change and mental health: a causal pathways framework. International journal of public health, 55, 123-132.

Berry, H. L., Waite, T. D., Dear, K. B., Capon, A. G., & Murray, V. (2018). The case for systems thinking about climate change and mental health. Nature climate change, 8(4), 282-290.

Charlson, F., Ali, S., Benmarhnia, T., Pearl, M., Massazza, A., Augustinavicius, J., & Scott, J. G. (2021). Climate change and mental health: a scoping review. International journal of environmental research and public health, 18(9), 4486.

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Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.jised.com
DOI: 10.55573/JISED.085708

Clayton, S. (2020). Climate anxiety: Psychological responses to climate change. Journal of anxiety disorders, 74, 102263.

Devine-Wright, P., Price, J., & Leviston, Z. (2015). My country or my planet? Exploring the influence of multiple place attachments and ideological beliefs upon climate change attitudes and opinions. Global Environmental Change, 30, 68-79.

Hickman, C., Marks, E., Pihkala, P., Clayton, S., Lewandowski, R. E., Mayall, E. E., ... & van Susteren, L. (2021). Climate anxiety in children and young people and their beliefs about government responses to climate change: a global survey. The Lancet Planetary Health, 5(12), e863-e873.

Hogg, T. L., Stanley, S. K., & O'Brien, L. V. (2023). Synthesising psychometric evidence for the Climate Anxiety Scale and Hogg Eco-Anxiety Scale. Journal of Environmental Psychology, 88, 102003.

Kauhanen, L., Wan Mohd Yunus, W. M. A., Lempinen, L., Peltonen, K., Gyllenberg, D., Mishina, K., ... & Sourander, A. (2023). A systematic review of the mental health changes of children and young people before and during the COVID-19 pandemic. European child & adolescent psychiatry, 32(6), 995-1013.

Li, B., Hu, K., Lysenko, V., Khan, K. Y., Wang, Y., Jiang, Y., et al. (2022). A scientometric analysis of agricultural pollution by using bibliometric software VoSViewer and histcite™. Environ. Sci. pollut. Res. 29, 37882–37893.

Pörtner, H. O., Roberts, D. C., Poloczanska, E. S., Mintenbeck, K., Tignor, M., Alegría, A., ... & Okem, A. (2022). IPCC, 2022: Summary for policymakers.

Sri, A., Bhugra, D., Persaud, A., Tribe, R., Gnanapragasam, S., Castaldelli-Maia, J. M., ... & Ventriglio, A. (2023). Global Mental Health and Climate Change: a Geo-Psychiatry perspective. Asian Journal of Psychiatry, 103562.

Stanley, S. K., Hogg, T. L., Leviston, Z., & Walker, I. (2021). From anger to action: Differential impacts of eco-anxiety, eco-depression, and eco-anger on climate action and wellbeing. The Journal of Climate Change and Health, 1, 100003.

Watts, N., Amann, M., Arnell, N., Ayeb-Karlsson, S., Belesova, K., Boykoff, M., ... & Montgomery, H. (2019). The 2019 report of The Lancet Countdown on health and climate change: ensuring that the health of a child born today is not defined by a changing climate. The Lancet, 394(10211), 1836-1878.

WHO. (2022). Mental Health and Climate Change: Policy Brief.