



ORIGINAL

The Impact of Cognitive Behavioural Therapy on Depression among Individuals with Adverse Childhood Experiences: A Bibliometric Analysis

Impacto de la terapia cognitivo-conductual en la depresión entre individuos con experiencias adversas en la niñez: un análisis bibliométrico

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Cite as: Reddy NP, Sureshkumar K, Kumar S. The Impact of Cognitive Behavioural Therapy on Depression among Individuals with Adverse Childhood Experiences: A Bibliometric Analysis. *Salud, Ciencia y Tecnología - Serie de Conferencias*. 2025; 4:1370. <https://doi.org/10.56294/sctconf20251370>

Submitted: 09-06-2024

Revised: 21-09-2024

Accepted: 07-01-2025

Published: 08-01-2025

Editor: Prof. Dr. William Castillo-González 

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ABSTRACT

Introduction: adverse Childhood experiences have been found to be the major contributor towards the global concern of disease and disability. They are potentially traumatic life events occurring before the age of eighteen that require major psychological, social and neurobiological adaptation representing a shift from an acceptable setting in which a child is to be reared in. The main aim of the current study is to comprehend the evolution of research conducted on the impact of cognitive behavioral therapy on Depression among Individuals with Adverse Childhood Experiences.

Method: the raw documentary units were extracted from the Scopus Database. 283 documentary units were then screened using the PRISMA model from which 235 documentary units were included for further analysis. Performance analysis and science mapping were analyzed using VOS viewer, R software and Hazing's Publish and Perish Software.

Results: from the results it was found that United States and United Kingdom secured the top ranking in terms of number of papers and citations. From the analysis it was found that medicine is the major contributing area followed by psychology. The current study also identified top authors, journals and research papers that were the major contributors in the area. Further bibliometric analysis showed the collaboration between different authors, journals, themes and organizations. Strong collaborative efforts between different countries and authors and various themes were identified.

Conclusion: the current analysis was successful in determining the areas where more comprehensive research is required. This article thereby serves to be an exponential guide for future researchers.

Keywords: Adverse Childhood Experiences; Depression; Cognitive Behavioral Therapy; Bibliometric.

RESUMEN

Introducción: se ha descubierto que las experiencias adversas de la infancia son el principal factor que contribuye a la preocupación mundial por las enfermedades y la discapacidad. Son acontecimientos vitales potencialmente traumáticos que ocurren antes de los dieciocho años y que requieren una importante adaptación psicológica, social y neurobiológica que representa un cambio desde un entorno aceptable en

el que se debe criar a un niño. El objetivo principal del presente estudio es comprender la evolución de la investigación realizada sobre el impacto de la terapia cognitivo-conductual en la depresión entre personas con experiencias adversas en la infancia.

Método: las unidades documentales en bruto fueron extraídas de la Base de Datos Scopus. Luego se proyectaron 283 unidades documentales utilizando el modelo PRISMA de las cuales se incluyeron 235 unidades documentales para su posterior análisis. El análisis de rendimiento y el mapeo científico se analizaron utilizando el visor VOS, el software R y el software Publish and Perish de Hazing.

Resultados: de los resultados se encontró que Estados Unidos y Reino Unido obtuvieron el primer puesto en términos de número de artículos y citas. Del análisis se encontró que la medicina es el área que más contribuye, seguida por la psicología. El estudio actual también identificó a los principales autores, revistas y artículos de investigación que fueron los principales contribuyentes en el área. Un análisis bibliométrico adicional mostró la colaboración entre diferentes autores, revistas, temas y organizaciones. Se identificaron fuertes esfuerzos de colaboración entre diferentes países y autores y diversos temas.

Conclusiones: el análisis actual logró determinar las áreas donde se requiere una investigación más exhaustiva. Este artículo sirve así como una guía exponencial para futuros investigadores.

Palabras clave: Experiencias Adversas de la Infancia; Depresión; Terapia Cognitivo-Conductual; Bibliométrico.

INTRODUCTION

Adverse Childhood experiences are considered to be a major contributor towards global concern of disease and disability. They are potentially traumatic life events occurring before the age of eighteen that require major psychological, social and neurobiological adaptation representing a shift from an acceptable setting in which a child is to be reared in. Major changes in neurodevelopmental trajectories can impair the social, psychological and cognitive functioning of an individual.⁽¹⁾ Nearly 3 in 4 children around the age of two to four years frequently undergo physical and mental abuse with around 1 in 5 females and 1 in 13 males are found to be sexually abused between 0-17 years. Early adversities such as physical abuse as well as sexual abuse and other adverse experiences are closely associated to major brain dysfunctions. A child's developing brain exposed to chronic stress due to ACE's can lead to an increase in stress reactivity, risk of developing maladaptive ways of coping and an increased risk for depression in adulthood.⁽²⁾

Many epidemiological and neurobiological studies have reported the lasting profound effect inflicted on the overall health throughout one's lifespan due to childhood adversities. A dose-response association has been determined by studies, with the increase in the number of adverse childhood experiences leading to increase in the likelihood of unfavourable outcomes during the later phases of life.⁽³⁾ The Centre for disease control has shown that around 61 percentage of the adults across the United states are subjected to at least one ACE and every 1 in 6 adults have been exposed to 4 or more types of ACEs.⁽⁴⁾ A strong link between ACE's and other major mental and physical health outcomes such as eating disorders, obesity, ischemic heart disease, strokes, cancer, anxiety, depression, and substance abuse has been found.^(5,6)

The presence of maltreatment, parental abuse, and any form of family dysfunction during childhood has a negative influence on adult health thereby showcasing the absolute need to ensure public health safety by developing prevention strategies to prevent children from having severe effects in their later life.⁽⁶⁾ Studies have also focused on ACE and its predominant effect on major adult mental health outcomes such as anxiety, ADHD, depression, conduct problems and substance addiction.^(7,8) A strong link was determined among psychiatric disorders during adulthood and early life adversities especially for those who have been exposed to multiple ACEs, with the level of trauma influencing the severity of mental disorder.⁽⁴⁾

Depression and ACE

Depression is a most commonly occurring mental health condition which is considered to be a public concern affecting 300 million people globally.⁽⁹⁾ Depression is a debilitating health problem with many adults suffering from depression and is prevailing to be one of the major causes of disease and disability.⁽¹⁰⁾ Depression has been described as a negative affect state that disrupts an individual's general day-to-day functioning and welfare, with affect states ranging from sadness to dissatisfaction, despondency and Pessimism. People with depression undergo various social, physical, and cognitive changes, potentially impacting the overall quality of life.⁽¹¹⁾ Depression is considered to be one of the most prevalent and incapacitating personal and public health issue. By 2030, it has been anticipated that depression would rise to be the most prominent cause of disability prevailing in 7,5 % of the population.⁽⁹⁾

Childhood maltreatment has been getting increased attention especially to establish empirical evidence on

the association between ACEs and depressive disorders.⁽¹²⁾ Children exposed to any form of abuse or neglect are at a greater risk for depression, drug abuse, alcohol abuse, dangerous sexual behaviour, chronic ailments, and even suicide.⁽¹³⁾ A vast amount of literature has established a strong connection among the presence of childhood adversities and the risk of diagnosis and severity of Major depressive disorder.⁽¹⁴⁾ There is notable research investigating the collaboration between specific forms of childhood adversity and depression. While a strong relationship between household dysfunction and the probability of experiencing depression has been established, there are studies that contradict this and stated that abuse, neglect, and violence during childhood predicted higher levels of depression, but the same did not hold true for household dysfunction.⁽¹⁵⁾

Existing literature has determined harmful effects on the mental health of adults and a possible increase in the likelihood of depression can be caused due to the exposure to adverse childhood experiences.⁽¹⁶⁾ There is a considerable difference among childhood adversity and the clinical condition of diseases which includes an early onset, with a more prolonged disease course, increase in the symptom severity and a lack of treatment progress outcomes.^(17,18) Around 56,9 % participants with childhood trauma have been identified as having depression. People who tend to be exposed to chronic stress tend to become increasingly sensitized to stress, which thereby leads to producing more distressing emotions in response to even minor stressors generating higher negative emotions with each exposure.^(19,20)

CBT and Depression

Cognitive behavioural therapy is considered to be a prominent evidence based intervention for depression.⁽²¹⁾ It explores the link between various thoughts, emotions and behaviour and is built on the principle that maladaptive thinking patterns facilitate the diagnosis as well as maintenance of depression. Restructuring negative cognitions will help bring about a change in emotion regulation as well as dysfunctional behaviours.⁽²²⁾ Individuals diagnosed with depression and have undergone through Adverse Childhood Experiences have unfavorable course of treatment response and progress, thereby causing an increased likelihood of relapse and enduring depressive episodes. Thus, it is crucial that a tailor made approach is utilized to effectively treat traumatic experiences.⁽²³⁾ Depression and anxiety have been shown to significantly reduce the everyday functioning, well-being and quality of life of an individual, thereby putting forward the need for treatments that can be delivered cost-efficiently on a large scale in a timely manner. Cognitive behavioral therapy can be considered as one of the most well established intervention for anxiety and depression among adults. With abundant scientific evidence of randomized controlled trials over the last two decades validating the efficiency of the treatment.^(24,25)

CBT is recognised to be the most common and effective psychological intervention to treat depression. It is evidence-based and widely used for treating major depressive disorders. It is a well-structured widely tested psychosocial intervention that provides benefits that go beyond treatment termination validated with more than 80 controlled trials.⁽²⁶⁾ The Two crucial elements of CBT for treating depression are: i) behavioral activation that aims towards looking into the reciprocal relationship that exists among negative affect states, and behaviors and ii)cognitive restructuring that aims to increase adaptive behavior associated with a positive mood and to identify and challenge the maladaptive automatic thoughts.^(27,28) Several studies have determined that patients diagnosed with depression who underwent through cognitive behavioral therapy showed reduced risk of depression relapse than patients who had received antidepressant medication.⁽²⁹⁾

This thereby showcases the importance the current area holds and it is exponential that we understand the already existing publications to cater to research gaps and to extend the empirical evidence. The current study thus aims to i) comprehend the evolution of research over time and to identify patterns or trends in publication frequency ii) identify and understand the current trends in publishing research in the area being studied iii) identify the major contributors of the existing literature iv) identify collaborative patterns among the literature and understand various themes the studies are based on.

METHOD

The methodology of the current study is based on bibliometric techniques, which will help us to have a comprehensive and in depth understanding of publications at different levels related to the impact of cognitive behavioral therapy on depression among individuals with adverse childhood experiences. This bibliometric methodology will aid in the application of quantitative methods such as citation analysis, co-author analysis, bibliometric coupling etc on bibliometric data such as documentary units.⁽³⁰⁾ This will aid to encapsulate the scholarly outlook of an area by determining the relationships that exists between different research components, thus providing us with an holistic understanding.⁽³¹⁾

The recent advancement in the area of bibliometric analysis will help scientists and researchers make sense of large unstructured raw datasets on various publications in a particular area and analyze them in a way that will help us to identify hidden patterns among publications, gaps in scientific knowledge present in a research topic, provide information on the state of the art and enumerate various other research questions that can be

further studied.⁽³²⁾ The first major step when it comes to a bibliometric study is to find an appropriate database with an adequate rationale which can be used to retrieve relevant documents on the topic being studied.

Database and Data extraction

Scopus was chosen to be the scientific database from which the documentary units will be extracted. Scopus has been estimated to be the most comprehensive database, with a wide coverage of over 25 000 journals and access to 1,7 million citations across the fields of science, medicine, social sciences, technology, the arts and humanities etc.⁽³³⁾ The second major step when it comes to bibliometric studies is to build a valid search query that will help us to extract as many documents relevant to the topic as possible with the minimum irrelevant results. All the documentary units extracted using the Search words will be assessed in detail during this phase.

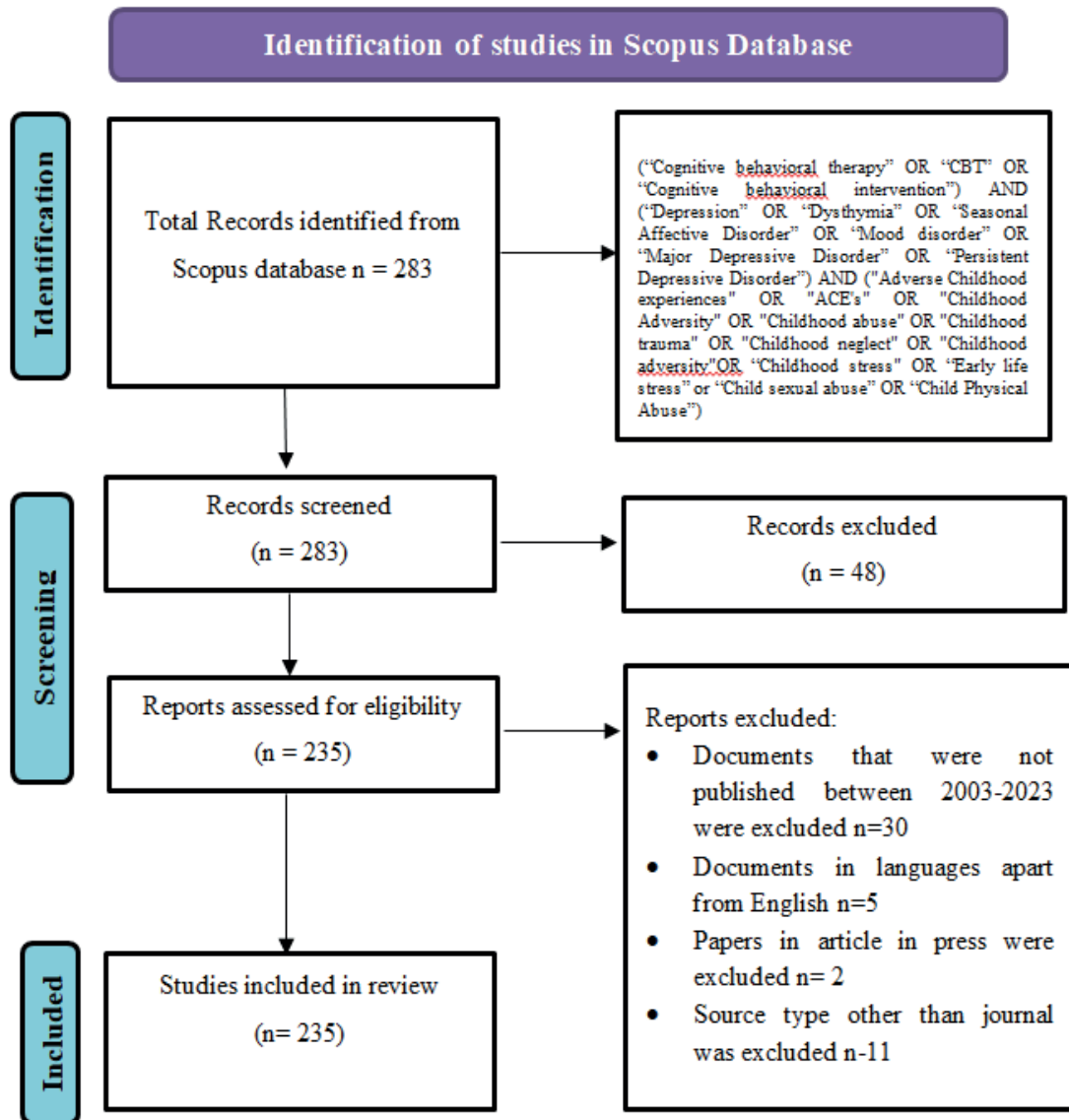


Figure 1. The PRISMA method was used to describe the procedures in identifying and selecting the research papers⁽³⁴⁾

All relevant documents focusing on Cognitive Behavioural Therapy, Depression and Adverse Childhood Experience were extracted using a thorough and comprehensive search query developed by the author. Already existing bibliometric articles were reviewed to build an advanced search query. After the search terms were finalized through extensive review and consulting with field experts, boolean expressions such as double quotes and Boolean operators (OR, AND, NOT) were used to ensure that the relevant search was made. TITLE-ABS-KEY is used as the default search field in the Scopus database. Thus the final advanced search query was built has shown: (TITLE-ABS-KEY (\"Cognitive behavioral therapy\" OR \"CBT\" OR \"Cognitive behavioral intervention\") AND TITLE-ABS-KEY (\"Depression\" OR \"Dysthymia\" OR \"Seasonal Affective Disorder\" OR \"Mood

disorder” OR “Major Depressive Disorder” OR “Persistent Depressive Disorder”) AND TITLE-ABS-KEY (“Adverse Childhood experiences” OR “ACE’s” OR “Childhood Adversity” OR “Childhood abuse” OR “Childhood trauma” OR “Childhood neglect” OR “Childhood adversity” OR “Childhood stress” OR “Early life stress” OR “Child sexual abuse” OR “Child Physical Abuse”))

Data Selection

A total of 283 documents were generated with the above-mentioned advanced search query. The PRISMA guidelines were used to extract, screen as well as select data relevant to the topic in hand. The documents were limited to the past 2 decades between 2003-2023 thereby excluding 30 documents. Only published documents were included thus 2 documents in articles in press were excluded. Books, book series and conference proceedings were excluded from the total documents thereby excluding 11 documents from the final documentary data that is to be included for further analysis. All the languages apart from English were excluded because of lack of representation of each of the languages thereby excluding around 5 documents. A total of 48 documents were excluded from the original search thereby 235 documents were used for further analysis.

Data Analysis

The bibliometric techniques in the current study includes two categories which are performance analysis as well as science mapping. Performance analysis will be used to examine the influence of the different research elements thereby determining the quantitative indicators.⁽³⁵⁾ Science mapping will be used in order to examine relationships between the different constituents thereby focusing on determining the collaborative patterns that would exist between these selected units.⁽³⁶⁾ The raw data of the finalized 235 documents were exported to microsoft excel on 9th June 2024 from scopus database for analysis. The bibliometric software VOS Viewer was used for science mapping in a pragmatic way in the current research area. Harzing Publish and Perish software were used to determine high impact papers which were identified using the h-index and the number of citations of a paper.⁽³⁷⁾

RESULTS

The results generated consists of both science mapping as well as performance analysis in order to meet the aim that has been set for the study. The documentary units that were generated from Scopus database showed that the literature on this area has an annual growth rate of 13,07 percent. It was found that 22 of the literature are produced by single authors with documents having an average age of 5,43 with average citations per document being 36,33 citations.

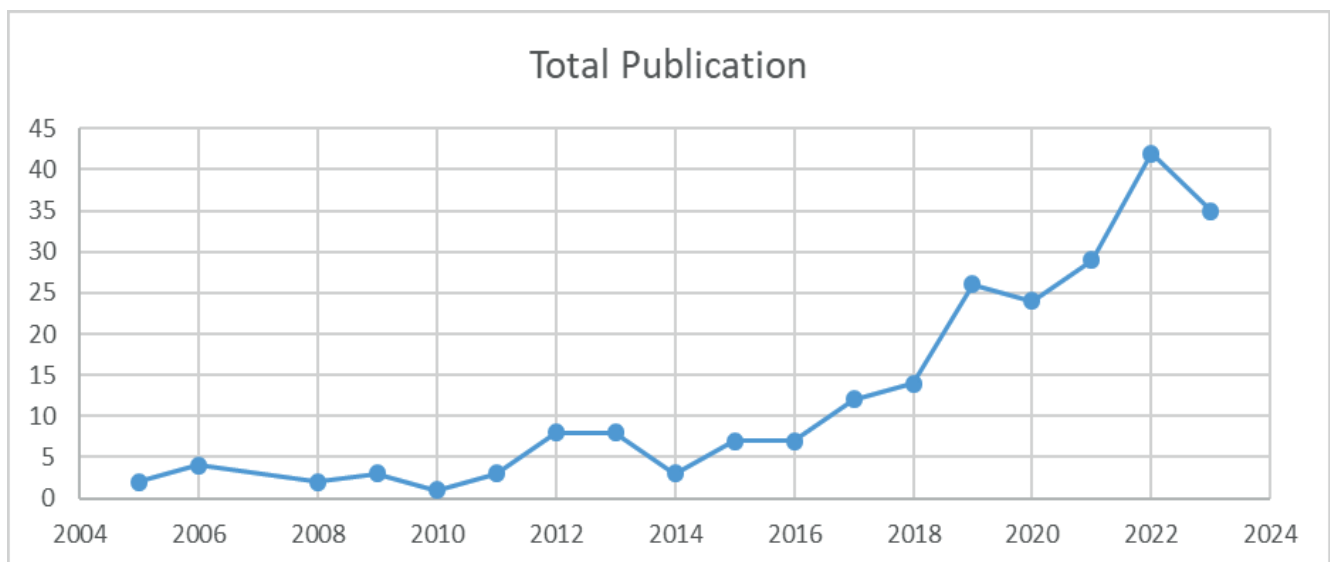


Figure 2. Year Wise Distribution of Publications⁽³⁸⁾

A total of 235 papers were generated between 2003 to 2023. It was found that more than half (66,38 %) of all the generated publications occurred between 2019 to 2023 which is the last 5 years of the study period. The highest numbers of papers were generated in the year 2022 (42, 17,87 %).

Rank	Countries	Publications (N,%)	Rank	Countries	Citations
1	United States	107 (45,53 %)	1	United States	5818
2	United Kingdom	30 (12,77 %)	2	United Kingdom	1333
3	Germany	28 (11,91 %)	3	Canada	1021
4	Netherlands	21 (8,94 %)	4	Italy	658
5	Canada	18 (7,66 %)	5	Germany	625
6	Australia	17 (7,23 %)	6	Australia	542
7	Italy	17 (7,23 %)	7	Netherlands	511
8	Spain	8 (3,40 %)	8	Sweden	389
9	Sweden	8 (3,40 %)	9	Spain	124
10	France	7 (2,98 %)	10	Brazil	118

Intervention based studies has been getting increased attention among different countries. Studies on depression is a most crucial area of research with an estimated 3,8 percentage of the population undergoing through depression.⁽³⁹⁾ This thereby urged a lot of researchers to look into the different intervention options and its subsequent benefits and effectiveness in order to enhance public health. However, it is expected that the publications by different scientists are to be unevenly distributed between different countries as the prevalence rates of depression and the availability of resource to do such extensive research in various regions are bound to vary. Table 1 determines the countries with top publications in this domain both based on number of documents and citations. From table 1 it was found that United States is the top most contributor with around 107 (45,53 %) publications and 5818 citations. This can be reasoned by the fact that United States has a highest prevalence rate with around 5,9 % of its population having depression. In terms of total publication, the United Kingdom, Germany, Netherlands and Canada succeeds the United States ranking second, third, fourth and fifth with 30 (12,77 %), 28 (11,91 %), 21 (8,94 %) and 18 (7,66 %) publications respectively. Australia, Italy, Spain, Sweden and France were also major contributors in term of total publications with 17 (7,23 %), 17 (7,23 %), 8 (3,40 %), 8 (3,40 %) and 7 (2,98 %) respectively. The table also highlights that the total publications and citations did not go hand in hand showing that there were difference in the quality and impact created by the different papers. United Kingdom, Canada, Italy, and Germany were ranked second, third, fourth and fifth with around 1333, 1021, 658 and 625 citations respectively. Other countries such as Australia (542), Netherlands (511), Sweden (389), Spain (124) and Brazil (118) were also significant contributors to the area under study.

Rank	Subject Area	No. of publications (N,%)
1	Medicine	194(82,55)
2	Psychology	83(35,31)
3	Neuroscience	48(20,42)
4	Biochemistry, Genetics and Molecular Biology	15(6,38)
5	Pharmacology, Toxicology and Pharmaceutics	8(3,40)

From table 2 it was found that medicine is the greatest contributing area on research on CBT and its impact on depression among individuals with ACE's with more than 80 percentage of publications. It was then followed by other prominent areas such as psychology (83), neuroscience (48), Biochemistry, Genetics and Molecular Biology (15).

Rank	Journals	TP	Ranks	Journals	TC
1	Brain Sciences	6	1	Journal Of The American Academy Of Child And Adolescent Psychiatry	2201
2	Child And Adolescent Psychiatric Clinics Of North America	6	2	Child Abuse And Neglect	295

3	Frontiers In Psychiatry	6	3	World Psychiatry	264
4	Child Abuse And Neglect	5	4	Child And Adolescent Psychiatric Clinics Of North America	246
5	Journal Of Affective Disorders	5	5	Journal of Consulting and Clinical Psychology	147
6	Journal Of Child And Adolescent Trauma	5	6	BMC Psychiatry	94
7	Journal Of Psychiatric Research	5	7	Psychological Trauma Theory Research Practice And Policy	67
8	Journal Of The American Academy Of Child And Adolescent Psychiatry	5	8	Brain Sciences	56
9	Psychological Trauma Theory Research Practice And Policy	5	9	Psychotherapy and psychosomatics	56
10	BMC Psychiatry	4	10	Journal of Psychiatric Research	39

The table 3 shows the total number of publications and citations among top 10 contributing journals. Brain sciences, Child and Adolescent Psychiatric Clinics of North America and Frontiers in Psychiatry have been majors contributors with 6 publications each. Other journals such as Child Abuse And Neglect, Journal Of Affective Disorders, Journal Of Affective Disorders, Journal Of Child And Adolescent Trauma, Journal Of Psychiatric Research, Journal Of The American Academy Of Child And Adolescent Psychiatry and Psychological Trauma Theory Research Practice And Policy had 5 publications each. In terms of citation, Journal of the American Academy of Child and Adolescent Psychiatry was ranked 1st with 2201 citations.

Rank	Author	TP	Rank	Author	TC
1	Cohen, J.A.	7	1	Cohen, J.A.	1901
2	Deblinger, E.	7	2	Mannarino, A.P.	1897
3	Mannarino, A.P.	6	3	Deblinger, E.	1514
4	Ociskova, M.	5	4	Steer, R.A.	1455
5	Prasko, J.	5	5	Runyon, M. K.	489
6	Schramm, E.	5	6	Schramm, E.	69
7	Slepecky, M.	5	7	Ociskova, M.	9
8	Steer, R.A.	5	8	Prasko, J.	9
9	Vanek, J.	5	9	Slepecky, M.	9
10	Runyon, M. K.	4	10	Vanek, J.	9

The table 4 highlights the highest contributing authors in term of total publications and citations. Cohen, J.A. is the highest contributing author with 7 publications and 1901 citations showcasing the quality and impact the author's work has created. The authors Deblinger, E., and Mannarino ranked 2nd and 3rd with 7 and 6 publications each. In terms of citations, the authors Mannarino, Deblinger, Steer and Runyon had 1897, 1514, 1455, and 489 citations respectively.

Cites/year	Citation	Authors	Year	Journal	Title
50,19	1054	F.W. Putnam	2003	Journal of the American Academy of Child and Adolescent Psychiatry	Ten-year research update review: Child sexual abuse ⁽⁴⁰⁾
39,6	792	J.A. Cohen, E. Deblinger, A.P. Mannarino, R.A. Steer	2004	Journal of the American Academy of Child and Adolescent Psychiatry	A multisite, randomized controlled trial for children with sexual abuse-related PTSD symptoms ⁽⁴¹⁾
81	324	E.R. Watkins, H. Roberts	2020	Behaviour Research and Therapy	Reflecting on rumination: Consequences, causes, mechanisms and treatment of rumination ⁽⁴⁴⁾

24,38	317	E. Deblinger, A.P. Mannarino, J.A. Cohen, M.K. Runyon, R.A. Steer	2011	Depression and Anxiety	Trauma-focused cognitive behavioral therapy for children: Impact of the trauma narrative and treatment length ⁽⁴⁵⁾
48,5	291	H. Akil, J. Gordon, R. Hen, J. Javitch, H. Mayberg, B. McEwen, M.J. Meaney, E.J. Nestler	2018	Neuroscience and Biobehavioral Reviews	Treatment resistant depression: A multi-scale, systems biology approach ⁽⁴⁶⁾
72,5	290	S. Fazel, B. Runeson	2020	New England Journal of Medicine	Suicide ⁽⁴⁷⁾
14,05	267	J.A. Cohen, A.P. Mannarino, K. Knudsen	2005	Child Abuse and Neglect	Treating sexually abused children: 1 Year follow-up of a randomized controlled trial ⁽⁴³⁾
13,2	264	C. Zayfert, J.C. De Viva	2004	Journal of Traumatic Stress	Residual Insomnia Following Cognitive Behavioral Therapy for PTSD ⁽⁴⁹⁾
46,6	233	M.R. Peltier, T.L. Verplaetse, Y.S. Mineur, I.L. Petrakis, K.P. Cosgrove, M.R. Picciotto, S.A. McKee	2019	Neurobiology of Stress	Sex differences in stress-related alcohol use ⁽⁴⁸⁾
12,22	220	E. Deblinger, A.P. Mannarino, J.A. Cohen, R.A. Steer	2006	Journal of the American Academy of Child and Adolescent Psychiatry	A follow-up study of a multisite, randomized, controlled trial for children with sexual abuse-related PTSD symptoms ⁽⁴²⁾

Table 5 indicates the top 10 high impact papers published by different authors in different journals. A study stated that child sexual abuse can lead to an increase in the risk of psychopathology, specifically for substance abuse and depression. The study stated that CBT is efficient for certain symptoms and that more longitudinal follow up as well as efficacy studies at a larger scale should be done.⁽⁴⁰⁾ This study was further validated and empirically supported that children who are sexually abused and have symptoms of PTSD and other related difficulties can be effectively treated by short term Trauma Focused-CBT approach.⁽⁴¹⁾ A follow up study showed that the TF CBT continued to show lesser PTSD symptoms among children as well as their caregivers as well as lesser perception of shame and parental distress that is abuse-specific at 6- and 12-month of assessments.⁽⁴²⁾ In a study, trauma-focused cognitive-behavioural therapy or non-directive supportive therapy was randomly assigned to 82 sexually abused children; the study examined the symptomatology during 12 months post treatment. The study provided additional evidence on the durability and effectiveness of TF-CBT.⁽⁴³⁾ The rumination can act as a Trans diagnostic mental health vulnerability impacting anxiety, depression, and other related conditions. Rumination is also known to interfere with therapy and reduce the efficiency of psychological intervention.⁽⁴⁴⁾ In “Trauma-focused cognitive behavioural therapy for children: Impact of the trauma narrative and treatment length” stated that mental health disorders are associated with Child sexual abuse (CSA). The study highlighted that Trauma focused -CBT is effective in improving participant symptomatology. Further, Several other studies also ascertain that childhood adversities had distinct implications during the later phases of an individual and Cognitive behavioural therapy has been an efficient way to manage the symptomology.^(45,46,47,48,49)

Co - Authorship Analysis

Co-authorship analysis is crucial to understand the exact collaboration that exists between the authors through joint publications. This will help us to understand the trends that exist between different authors. A total of 1143 authors from 789 organisations have contributed towards establishing a good base of research on the current topic being studied. Though there were only a few authors (87) who had published more than 2 or more articles, further analysis was found to see if any link can be established among the authors. With a total link strength ranging between 0 to 37 in a full counting method and restricting authors with more than 25 publications, a connection was formed between 19 authors. A total of three clusters showcasing collaboration among authors were determined with 8, 6 and 5 items respectively. The visualized was represented with 66 links and an overall total link strength of 99. The total link strength for author collaboration ranged between 0 - 37 among the different authors with ociskova, prasko, slepecky and vanek having the highest total link strength of 37. This shows that these authors had the highest level of collaboration with other different authors in order to produce Scholarly work in the current domain.

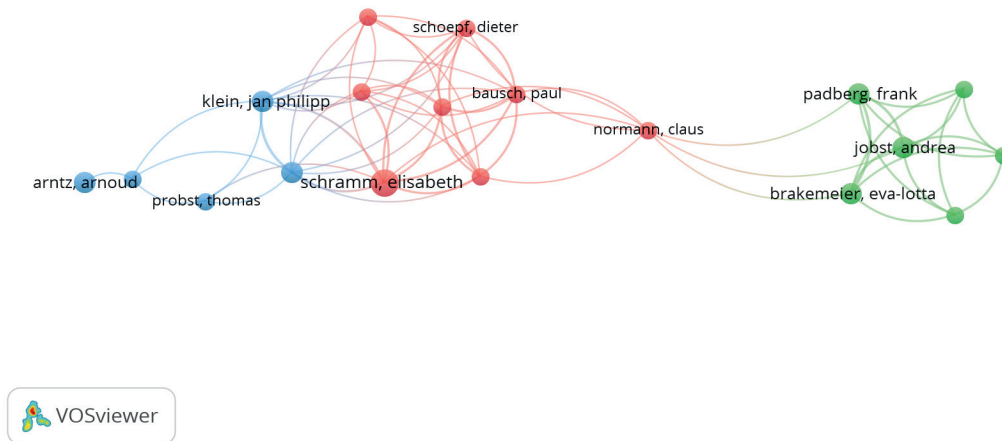


Figure 3. Visualization of Co-authorship Analysis among different authors⁽⁵⁰⁾

Country co-authorship analysis

Considering the importance and the nuances of the study it is essential that we comprehend the relevance of the current topic among the various countries and the extent of the collaboration that exists between authors of these different countries. Collaborations among different researchers and scientists will help highlight intellectual associations.⁽⁵²⁾ Figure 4a helps us to understand the collaborative networks present among different countries that were generated from the VOS software using the documentary units extracted. A total of 46 prominent countries were contributors for building the literature in this area. Limiting to countries with more than 2 documents and lesser than 25 documents, 32 prolific countries met the condition with a link strength between 2-66. Out of the 32 documents 29 connected thereby mapping 6 clusters with 7, 6, 6, 5, 3 and 2 items in each respective cluster.

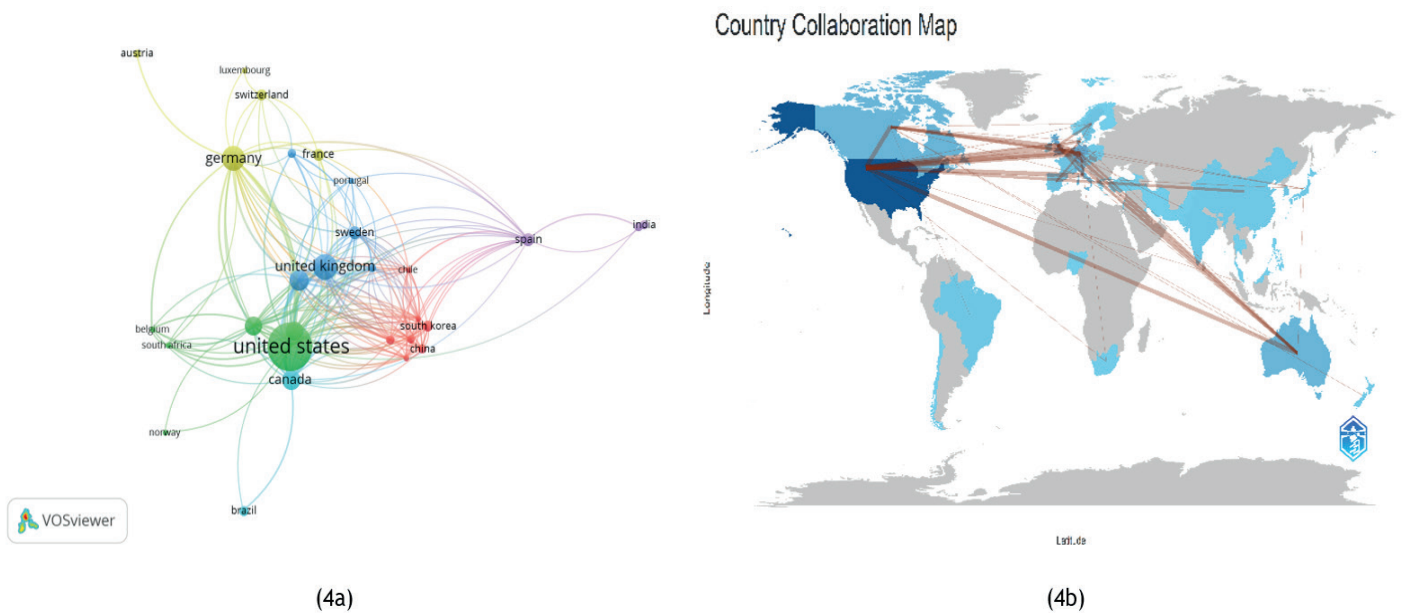


Figure 4. Visualization of Co-authorship analysis of different countries (a) and Country Collaboration Map (b) ^(50,51)

The total link strength generated by the visualization is 295 with 189 links. From the analysis provided by the VOS viewer it was found that United States has the most number of publications on the current topic with an overall link strength of 66 which is followed by United Kingdom with a total link strength of 47 indicating the sound intellectual interaction that exists between the researchers and their colleagues from other countries. These total link strength was closely followed by Germany (46), Netherlands (46) and Canada (42). These countries thus are more implicated on collaborative efforts to investigate the current topic with other countries rather than limiting the research within their geographic boundaries.

Keyword Analysis

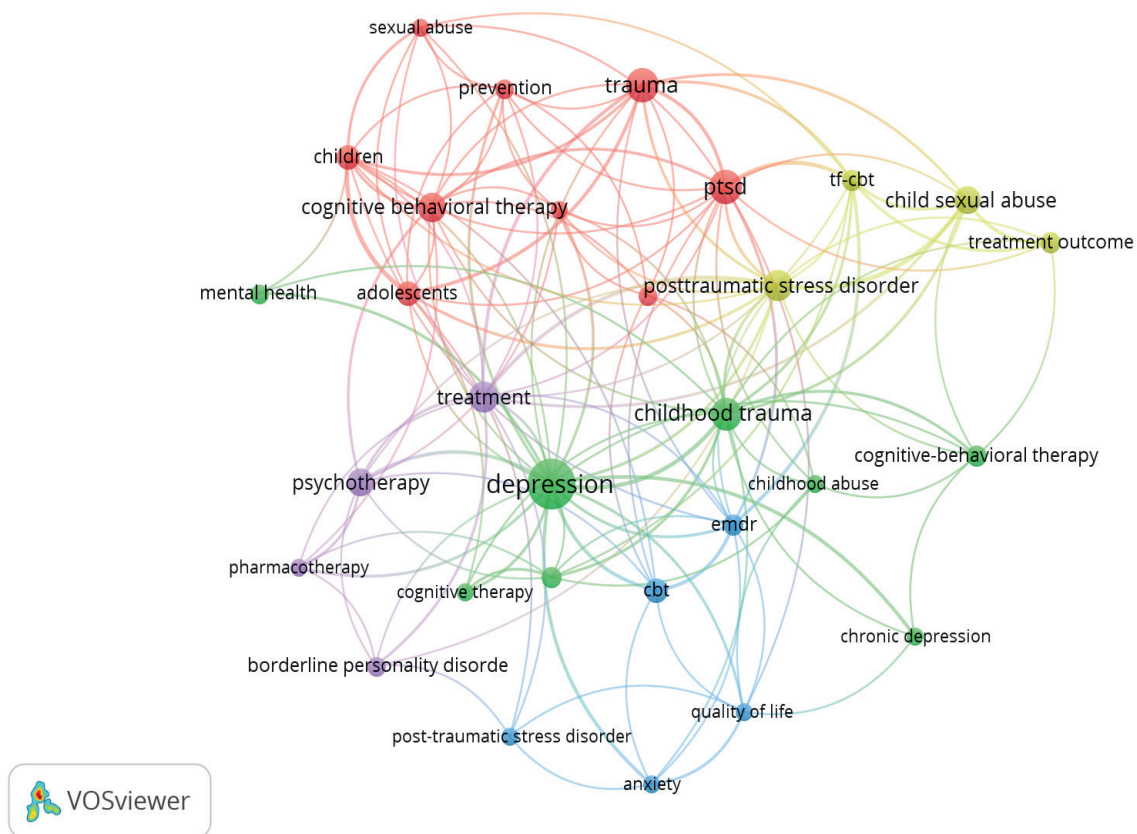


Figure 5. Visualization of Co-Occurrence of Keywords⁽⁵⁰⁾

The visualisation in figure 5 showcases the collaboration that exists between the keywords in different researches thereby helping us to identify patterns and trends that exist in the current study. The entire visualization has 140 links with total link strength of 209. The co-occurrence analysis was done in full counting restricting to author keywords in order to capture the essence of the impact of CBT on depression among individuals with ACE by avoiding abundant keywords that might deviate from the main themes. 660 author keywords were detected in which 30 met the threshold. With a total link strength ranging between 4 to 42, all the 30 keywords mapped forming 5 clusters. The first cluster consisted of 9 items which were adolescents, children, cognitive behavioral therapy, comorbidity, prevention, psychosis, ptsd, sexual abuse, and trauma. The second cluster consisted of 8 items which were childhood abuse, childhood trauma, chronic depression, cognitive therapy, cognitive-behavioral therapy, depression, major depressive disorder and mental health. Anxiety, CBT, EMDR, post-traumatic stress disorder, and quality of life were the 5 items that formed cluster 3. Cluster 4 and Cluster 5 had 4 items each with child sexual abuse, posttraumatic stress disorder, tf-cbt, and treatment outcome forming cluster 4 and borderline personality disorder, pharmacotherapy, psychotherapy, and treatment forming cluster 5. From the analysis it was also found that the top most keywords with the most occurrence were depression (35), ptsd (16), trauma (16), childhood trauma (15), posttraumatic stress disorder (14), treatment (14), Cognitive Behavioural Therapy (12), Child Sexual Abuse (11) and psychotherapy (11). In terms of collaboration, depression had the greatest number of collaborations with other keywords with a overall link strength of 42 showing that depression can be one of the main themes on the basis of which other keywords were investigated. Depression was closely followed by posttraumatic stress disorder, PTSD and childhood trauma with total link strength of 26, 25 and 25 respectively.

The tree map in figure 6 showcases the overall keywords including both index and author keywords. A total of 3020 keywords were identified from the current domain. 30 keywords were added on the basis of frequency of occurrence and size of the rectangle is based on the proportion of the represented term. It was found that nearly 7 percent of the total keywords were human (223) and cognitive behavioural therapy (215) and 6 percent of the keywords are female (197) and depression (196). This tree map thus helps us to have an overall understanding of the various aspects that enriches the current topic that has been explored on.



Figure 6. Tree map showcasing frequently occurring keywords⁽⁵¹⁾

Citations analysis

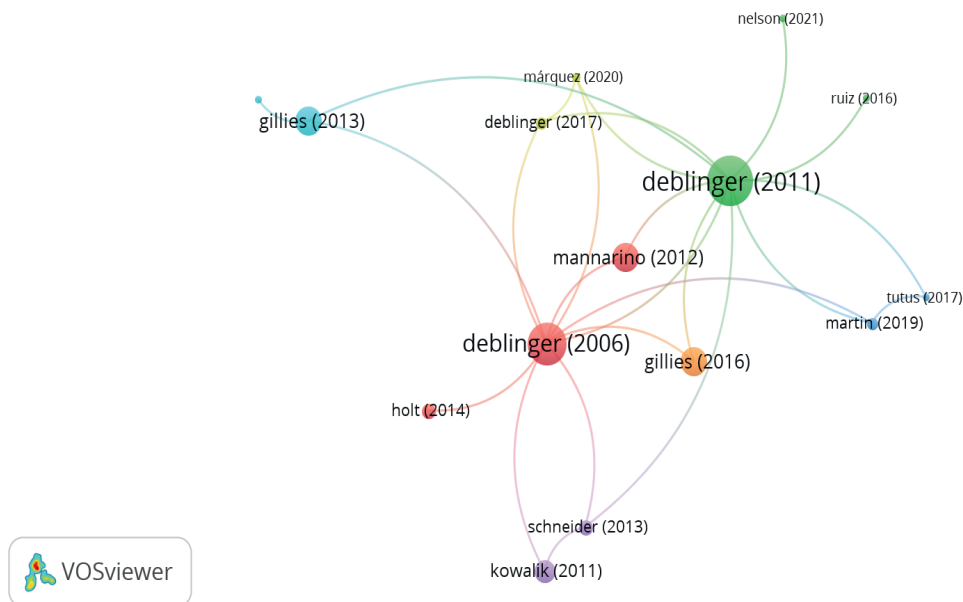


Figure 7. Visualization of Citation Analysis⁽⁵⁰⁾

Citation helps to determine the impact and the degree of recognition of a particular author, an article or a journal. An highly cited paper not only determines the influence it had on a particular area but it is also critically valued and supported by researchers and can be used as a base for future research. Citation analysis is one of the techniques of science mapping that will aid researchers comprehend the scholarly patterns that persists among publications that is formed when one article will cite the other.⁽⁵³⁾ Citation analysis was done

with documents as the unit of analysis. Out of the 235 documents only 144 met the threshold of having a minimum of 5 citations. Out of the 144 items, only 15 items connected to form clusters. A total of 7 clusters were mapped with 3, 3, 2, 2, 2, 2 and 1 items. The entire network was represented with 24 links. Though Putnam had the highest amount of citations it was found that Deblinger had the highest amount of links.^(40,45)

DISCUSSION

The research has successfully showcased the trends that exist in publications on the impact of cognitive behavioral therapy on depression among individuals with Adverse Childhood Experiences. A total of 283 publications were extracted on the topic being studied. After adequate screening, 235 papers were included for final analysis. The major findings of the study are 1) research in this area has been increasing in the consecutive years with more than 60 percentage of the publications done in the last five years 2) the study area is not restricted only to a specific aspect of mental health as it was explored in diverse areas such as medicine, biochemistry, pharmacology etc. thereby indicating the multidisciplinary approach that has been adopted in the current study 3) though depression has been considered to be a major cause of disability with high prevalence rates, only 23,5 % of the countries have contributed to the current study. Considering the cultural and social relevance of the topic it is important that more research is encouraged in other countries as well. 4) the countries such as the United States and the United Kingdom, with high prevalence rates of depression, were found to be the highest contributors with the number of documents generated and the influence that was created by these publications on other scholarly work 5) all the papers that were analyzed in the study were published in 143 peer reviewed journals 6) the top contributing papers in the areas had used different methodologies and have built concrete evidence on the efficacy of depression among individuals with adverse childhood experiences. The results obtained from the science mapping had implicated that 1) a strong collaboration exists between different authors thereby giving rise to quality intellect on the current topic 2) strong collaborative efforts between different countries were identified through country co-authorship analysis 3) the major themes of the study revolved around different types of childhood trauma, depression, CBT, Trauma Focused CBT and Psychotherapy.

CONCLUSIONS

The current article has been successful in analysing the global publication and research trends in literature between 2003 to 2023 related to the impact of cognitive behavioural therapy on depression among individuals with adverse childhood experiences. The current analysis was successful in determining the areas where more comprehensive research is required. The research gap is evident from the number of publications as well as the themes that were generated. The major conclusion is that the literature on this area has rapidly increased and has exponentially determined the efficiency of CBT as an intervention for depression. These studies have also helped practitioners and researchers to comprehend the relation that exist between childhood adversity and depression in the later phases of life. Future research can thus explicitly focus on analysing the research trends that exist between the relationship of Depression and adverse childhood experiences. Further research can also look into an in-depth analysis of each of the different childhood adversities and its relation to other mental health conditions. From the analysis it is found that around 80 percentage of the studies are focused in the area of medicine and hence more studies should be emphasized in other prominent areas such as psychology. Collaborations can be initiated among psychology, neuroscience, sociology and so on to analyze and determine preventive measures and strategies. This article thereby serves to be an exponential guide for researchers for future investigation on the current area.

REFERENCES

1. Shonkoff JP, Garner AS, Committee on Psychosocial Aspects of Child and Family Health, Committee on Early Childhood, Adoption, and Dependent Care, Section on Developmental and Behavioral Pediatrics. The lifelong effects of early childhood adversity and toxic stress. *Pediatrics*. 2012;129(1):e232-46. Available from: <http://dx.doi.org/10.1542/peds.2011-2663>
2. Nemeroff CB. Paradise lost: The neurobiological and clinical consequences of child abuse and neglect. *Neuron*. 2016;89(5):892-909. Available from: <http://dx.doi.org/10.1016/j.neuron.2016.01.019>
3. Hughes K, Bellis MA, Hardcastle KA, Sethi D, Butchart A, Mikton C, et al. The effect of multiple adverse childhood experiences on health: a systematic review and meta-analysis. *Lancet Public Health*. 2017;2(8):e356-66. Available from: [http://dx.doi.org/10.1016/S2468-2667\(17\)30118-4](http://dx.doi.org/10.1016/S2468-2667(17)30118-4)
4. CDC. Adverse Childhood Experiences (ACEs) [Internet]. Centers for Disease Control and Prevention. 2024 [cited 2024 Oct 13]. Available from: <https://www.cdc.gov/vitalsigns/aces/index.html>.

5. Bellis MA, Hughes K, Leckenby N, Jones L, Baban A, Kachaeva M, et al. Adverse childhood experiences and associations with health-harming behaviours in young adults: surveys in eight eastern European countries. *Bull World Health Organ.* 2014;92(9):641-55. Available from: <http://dx.doi.org/10.2471/BLT.13.129247>

6. Felitti VJ, Anda RF, Nordenberg D, Williamson DF, Spitz AM, Edwards V, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. *Am J Prev Med.* 1998;14(4):245-58. Available from: [http://dx.doi.org/10.1016/s0749-3797\(98\)00017-8](http://dx.doi.org/10.1016/s0749-3797(98)00017-8)

7. Mersky JP, Topitzes J, Reynolds AJ. Impacts of adverse childhood experiences on health, mental health, and substance use in early adulthood: a cohort study of an urban, minority sample in the U.S. *Child Abuse Negl.* 2013;37(11):917-25. Available from: <http://dx.doi.org/10.1016/j.chiabu.2013.07.011>

8. Semiz ÜB, Öner Ö, Cengiz FF, Bilici M. Childhood abuse and neglect in adult attention-deficit/hyperactivity disorder. *Psyc. Clin Psychopharmacol.* 2017;27(4):344-8. Available from: <http://dx.doi.org/10.1080/24750573.2017.1367551>

9. WHO. Depression and other common mental disorders: Global health estimates, Geneva, Switzerland: 2017

10. Whiteford HA, Degenhardt L, Rehm J, Baxter AJ, Ferrari AJ, Erskine HE, et al. Global burden of disease attributable to mental and substance use disorders: findings from the Global Burden of Disease Study 2010. *Lancet.* 2013;382(9904):1575-86. Available from: [http://dx.doi.org/10.1016/S0140-6736\(13\)61611-6](http://dx.doi.org/10.1016/S0140-6736(13)61611-6)

11. Malinowski AS, Veselka L, Atkinson BE. An investigation of vulnerability factors for depression. *Pers Individ Dif.* 2017;107:126-30. Available from: <http://dx.doi.org/10.1016/j.paid.2016.11.049>

12. Humphreys KL, LeMoult J, Wear JG, Piersiak HA, Lee A, Gotlib IH. Child maltreatment and depression: A meta-analysis of studies using the Childhood Trauma Questionnaire. *Child Abuse Negl.* 2020;102(104361):104361. Available from: <http://dx.doi.org/10.1016/j.chiabu.2020.104361>

13. Anda RF, Butchart A, Felitti VJ, Brown DW. Building a framework for global surveillance of the public health implications of adverse childhood experiences. *Am J Prev Med.* 2010;39(1):93-8. Available from: <http://dx.doi.org/10.1016/j.amepre.2010.03.015>

14. Giampetruzzi E, Tan AC, LoPilato A, Kitay B, Riva Posse P, McDonald WM, et al. The impact of adverse childhood experiences on adult depression severity and treatment outcomes. *J Affect Disord.* 2023;333:233-9. Available from: <http://dx.doi.org/10.1016/j.jad.2023.04.071>

15. Elmore AL, Crouch E. Anxiety, depression, and adverse childhood experiences: An update on risks and protective factors among children and youth. *Acad Pediatr.* 2023;23(4):720-1. Available from: <http://dx.doi.org/10.1016/j.acap.2022.11.013>

16. Tian F, Meng SS, Qiu P. Childhood adversities and mid-late depressive symptoms over the life course: Evidence from the China health and retirement longitudinal study. *J Affect Disord.* 2019;245:668-78. Available from: <http://dx.doi.org/10.1016/j.jad.2018.11.028>

17. Harkness KL, Bagby RM, Kennedy SH. Childhood maltreatment and differential treatment response and recurrence in adult major depressive disorder. *J Consult Clin Psychol.* 2012;80(3):342-53. Available from: <http://dx.doi.org/10.1037/a0027665>

18. Nanni V, Uher R, Danese A. Childhood maltreatment predicts unfavorable course of illness and treatment outcome in depression: a meta-analysis. *Am J Psychiatry.* 2012;169(2):141-51. Available from: <http://dx.doi.org/10.1176/appi.ajp.2011.11020335>

19. Gould F, Harvey PD, Hodgins G, Jones MT, Michopoulos V, Maples-Keller J, et al. Prior trauma-related experiences predict the development of posttraumatic stress disorder after a new traumatic event. *Depress Anxiety.* 2021;38(1):40-7. Available from: <http://dx.doi.org/10.1002/da.23084>

20. Harkness KL, Hayden EP, Lopez-Duran NL. Stress sensitivity and stress sensitization in psychopathology: an introduction to the special section. *J Abnorm Psychol.* 2015;124(1):1-3. Available from: <http://dx.doi.org/10.1037/abn0000041>
21. Depression: The Treatment and Management of Depression in Adults (Updated Edition). Leicester: British Psychological Society; 2010.
22. Beck A. *Cognitive Therapy of Depression.* New York, NY: Guilford Press; 1979
23. Williams LM, Debattista C, Duchemin A-M, Schatzberg AF, Nemeroff CB. Childhood trauma predicts antidepressant response in adults with major depression: data from the randomized international study to predict optimized treatment for depression. *Transl Psychiatry.* 2016;6(5):e799. Available from: <http://dx.doi.org/10.1038/tp.2016.61>
24. Sadler P, McLaren S, Klein B, Harvey J, Jenkins M. Cognitive behavior therapy for older adults with insomnia and depression: a randomized controlled trial in community mental health services. *Sleep.* 2018;41(8). Available from: <http://dx.doi.org/10.1093/sleep/zsy104>
25. Nakagawa A, Mitsuda D, Sado M, Abe T, Fujisawa D, Kikuchi T, et al. Effectiveness of supplementary cognitive-behavioral therapy for pharmacotherapy-resistant depression: A randomized controlled trial. *J Clin Psychiatry.* 2017;78(8):1126-35. Available from: <http://dx.doi.org/10.4088/JCP.15m10511>
26. Practice guideline for the treatment of patients with major depressive disorder (revision). American Psychiatric Association. *Am J Psychiatry.* 2000;157(4 Suppl):1-45
27. Hawley LL, Padesky CA, Hollon SD, Mancuso E, Laposa JM, Brozina K, et al. Cognitive-behavioral therapy for depression using mind over mood: CBT skill use and differential symptom alleviation. *Behav Ther.* 2017;48(1):29-44. Available from: <http://dx.doi.org/10.1016/j.beth.2016.09.003>
28. Sudak DM. Cognitive behavioral therapy for depression. *Psychiatr Clin North Am.* 2012;35(1):99-110. Available from: <http://dx.doi.org/10.1016/j.psc.2011.10.001>
29. Hollon SD, DeRubeis RJ, Shelton RC, Amsterdam JD, Salomon RM, O'Reardon JP, et al. Prevention of relapse following cognitive therapy vs medications in moderate to severe depression. *Arch Gen Psychiatry.* 2005;62(4):417. Available from: <http://dx.doi.org/10.1001/archpsyc.62.4.417>
30. Broadus RN. Toward a definition of "bibliometrics." *Scientometrics.* 1987;12(5-6):373-9. Available from: <http://dx.doi.org/10.1007/bf02016680>
31. Moustakas L. A bibliometric analysis of research on social cohesion from 1994-2020. *Publications.* 2022;10(1):5. Available from: <http://dx.doi.org/10.3390/publications10010005>
32. Vlase I, Lähdesmäki T. A bibliometric analysis of cultural heritage research in the humanities: The Web of Science as a tool of knowledge management. *Humanit Soc Sci Commun.* 2023;10(1). Available from: <http://dx.doi.org/10.1057/s41599-023-01582-5>
33. Elsevier Content Coverage Guide; Elsevier: Amsterdam, The Netherlands, 2010;1-24
34. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *BMJ.* 2009; 21;339: b2535. Available from: <https://doi.org/10.1136/bmj.b2535>
35. Cobo MJ, López-Herrera AG, Herrera-Viedma E, Herrera F. An approach for detecting, quantifying, and visualizing the evolution of a research field: A practical application to the Fuzzy Sets Theory field. *J Informetr.* 2011;5(1):146-66. Available from: <http://dx.doi.org/10.1016/j.joi.2010.10.002>
36. Baker HK, Kumar S, Pandey N. Forty years of the Journal of Futures Markets: A bibliometric overview. *J Futures Mark.* 2021;41(7):1027-54. Available from: <http://dx.doi.org/10.1002/fut.22211>
37. Hirsch JE. An index to quantify an individual's scientific research output. *Proc Natl Acad Sci USA.*

2005;102(46):16569-72. Available from: <http://dx.doi.org/10.1073/pnas.0507655102>

38. Scopus. (n.d.). Scopus Database. Elsevier. Retrieved from <https://www.scopus.com>

39. World Health Organization: WHO & World Health Organization: WHO. 2023. Depressive disorder (depression). [https://www.who.int/news-room/fact-sheets/detail/depression#:~:text=An%20estimated%203.8%25%20of%20the,world%20have%20depression%20\(1\).](https://www.who.int/news-room/fact-sheets/detail/depression#:~:text=An%20estimated%203.8%25%20of%20the,world%20have%20depression%20(1).)

40. Putnam FW. Ten-year research update review: child sexual abuse. *J Am Acad Child Adolesc Psychiatry*. 2003;42(3):269-78. Available from: <http://dx.doi.org/10.1097/00004583-200303000-00006>

41. Cohen JA, Deblinger E, Mannarino AP, Steer RA. A multisite, randomized controlled trial for children with sexual abuse-related PTSD symptoms. *J Am Acad Child Adolesc Psychiatry*. 2004;43(4):393-402. Available from: <http://dx.doi.org/10.1097/00004583-200404000-00005>

42. Deblinger E, Mannarino AP, Cohen JA, Steer RA. A follow-up study of a multisite, randomized, controlled trial for children with sexual abuse-related PTSD symptoms. *J Am Acad Child Adolesc Psychiatry*. 2006;45(12):1474-84. Available from: <http://dx.doi.org/10.1097/01.chi.0000240839.56114.bb>

43. Cohen JA, Mannarino AP, Knudsen K. Treating sexually abused children: 1 year follow-up of a randomized controlled trial. *Child Abuse Negl*. 2005;29(2):135-45. Available from: <http://dx.doi.org/10.1016/j.chiabu.2004.12.005>

44. Watkins ER, Roberts H. Reflecting on rumination: Consequences, causes, mechanisms and treatment of rumination. *Behav Res Ther*. 2020;127(103573):103573. Available from: <http://dx.doi.org/10.1016/j.brat.2020.103573>

45. Deblinger E, Mannarino AP, Cohen JA, Runyon MK, Steer RA. Trauma-focused cognitive behavioral therapy for children: impact of the trauma narrative and treatment length. *Depress Anxiety*. 2011;28(1):67-75. Available from: <http://dx.doi.org/10.1002/da.20744>

46. Akil H, Gordon J, Hen R, Javitch J, Mayberg H, McEwen B, et al. Treatment resistant depression: A multi-scale, systems biology approach. *Neurosci Biobehav Rev*. 2018;84:272-88. Available from: <http://dx.doi.org/10.1016/j.neubiorev.2017.08.019>

47. Fazel S, Runeson B. Suicide. *N Engl J Med*. 2020;382(3):266-74. Available from: <http://dx.doi.org/10.1056/NEJMra1902944>

48. Peltier MR, Verplaetse TL, Mineur YS, Petrakis IL, Cosgrove KP, Picciotto MR, et al. Sex differences in stress-related alcohol use. *Neurobiol Stress*. 2019;10(100149):100149. Available from: <http://dx.doi.org/10.1016/j.ynstr.2019.100149>

49. Zayfert C, DeViva JC. Residual insomnia following cognitive behavioral therapy for PTSD. *J Trauma Stress*. 2004;17(1):69-73. Available from: <http://dx.doi.org/10.1023/B:JOTS.0000014679.31799.e7>

50. Van Eck NJ, Waltman L. Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*. 2010; 84(2): 523-538.

51. R Core Team. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. 2020. Available from: <https://www.R-project.org/>.

52. Cisneros L, Ibanescu M, Keen C, Lobato-Calleros O, Niebla-Zatarain J. Bibliometric study of family business succession between 1939 and 2017: mapping and analyzing authors' networks. *Scientometrics*. 2018;117(2):919-51. Available from: <http://dx.doi.org/10.1007/s11192-018-2889-1>

53. Appio FP, Cesaroni F, Di Minin A. Visualizing the structure and bridges of the intellectual property management and strategy literature: a document co-citation analysis. *Scientometrics*. 2014;101(1):623-61. Available from: <http://dx.doi.org/10.1007/s11192-014-1329-0>

FINANCING

None.

CONFLICT OF INTEREST

None.

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