# Quantitative And Qualitative Analysis Of Social Anxiety Disorder Treatment Methods: A Bibliometric Approach From The Perspective Of Cognitive Behavioral Theory

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| ARTICLE INFO | ABSTRACT |
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**Background:** Social anxiety is a common mental health issue characterized by fear of social situations. Social anxiety disorder is prevalent worldwide. Research indicates that cognitive-behavioral therapy is an effective approach to treating social anxiety disorder. Despite existing bibliometric studies on "social anxiety," there is currently no bibliometric research on treatment approaches for social anxiety disorder from the perspective of cognitive-behavioral theory.

**Methods**: This bibliometric study investigated the publication trends of treatment approaches for social anxiety disorder from the perspective of cognitive-behavioral theory in literature from 1997 to March 2024. Data were collected from the SCOPUS database. Various visualization maps were generated to illustrate annual publications, most relevant authors, sources, countries, topics, and keywords. Network analysis was conducted on these studies to assess research trends in the field. Additionally, a qualitative analysis was performed on data from 10 highly cited articles to elucidate common themes and methods used in research on treatment approaches for social anxiety disorder from the perspective of cognitive-behavioral theory.

**Results**: There has been an increase in citation rates for literature in this field. Most relevant papers since 2019 have been published in the journal "CLINICAL CASE STUDIES." Cluster analysis of keywords networks, including Cognitive Behavioral Theory, Social Anxiety Disorder, and Treatment, showed that the keyword theme "Cognitive Behavioral Theory" had the highest centrality. In terms of global research output, the United States leads in the publication of papers in this field, followed by the United Kingdom, Canada, and the Netherlands.

**Conclusion:** Bibliometric research on treatment approaches for social anxiety disorder from the perspective of cognitive-behavioral theory provides a clear vision for future research directions and identifies potential opportunities and challenges. This may guide new researchers in selecting appropriate subfields within the literature research domain of cognitive-behavioral theory and treatment approaches for social anxiety disorder.

**Keywords:** Cognitive Behavioral Therapy, Social Anxiety, Anxiety, Bibliometrics

## Introduction

Social Anxiety Disorder (SAD) is a psychological disorder characterized primarily by excessive fear of negative evaluation in social situations and avoidance behaviors (Association, 2013; de Hullu et al., 2017). Research indicates that social anxiety disorder is more common among adolescents, with a prevalence rate of 14.3% for

this disorder (Haddad et al., 2022; Huan et al., 2014). Furthermore, the global prevalence of social anxiety disorder is 29% (Yang et al., 2021). Cognitive Behavioral Therapy (CBT) is one of the effective methods for treating SAD, and its efficacy is supported by a large body of research(Fan, 2022; Iverach et al., 2017; Jankowska, 2019; Nordh et al., 2021; Sackl-Pammer et al., 2019).

Cognitive-behavioral theory posits that individuals with SAD often hold negative self-cognitions and distorted interpretations of social situations (Brozovich et al., 2015; Kim et al., 2020; Naim et al., 2018). CBT challenges and changes these irrational beliefs through cognitive restructuring and behavioral experiments, reducing avoidance behaviors and thereby lowering levels of social anxiety (Dumont et al., 2019; Norton et al., 2015). Research by Heimberg et al.(1998) indicates that CBT significantly reduces social anxiety symptoms in patients with SAD. This finding is supported by Carpenter et al., (2018) , who conducted a meta-analysis of randomized placebo-controlled trials, emphasizing the efficacy of CBT in improving symptoms of social anxiety disorder. Numerous scholars' research indicates that interventions based on cognitive behavioral theory are effective in reducing depression, anxiety, and fatigue, as well as enhancing self-efficacy across diverse populations (de Bérail et al., 2019; Doehrmann et al., 2013; Glassman et al., 2016).

Bibliometrics is a research field that analyzes specific literature within a particular research domain to uncover current trends and provide direction and momentum for future research(Feng et al., 2023; Li et al., 2020). This analysis is typically conducted using software tools such as CiteSpace and VOSviewer, which retrieve relevant literature from databases like Web of Science and SCOPUS within specific time frames to understand the global scientific research status on a particular topic. By comprehensively analyzing information such as the quantity of literature, citation counts, publication years, authors, and institutions, researchers can uncover hotspots and development directions in the research field(Bataglin & Kruglianskas, 2022; Kumar et al., 2019). This study aims to explore the current status of research in the field of treatment approaches for social anxiety disorder from the perspective of cognitive-behavioral theory using bibliometric methods from 1997 to the present year (March 2024).

An increasing number of scholars are now applying bibliometric methods to gauge the scientific progress and development of disciplines, facilitating systematic analyses of publications(Nunhes et al., 2021). Today, several widely used literature databases make generating bibliometric reports easier. These include the Web of Science (WoS), SCOPUS, and Google Scholar, among others, which offer integrated citation management features. Google Scholar provides free access to academic documents of all types. WoS and SCOPUS have extensive data repositories in various scientific fields for literature searches. For this study, SCOPUS database was chosen for research purposes.

## Methodology：

The method employed bibliometric analysis to evaluate the publication trends of literature focusing on cognitive behavioral therapy for improving social anxiety, aiming to extract insights from these trends. On March 6, 2024, a search was conducted in the well-known SCOPUS database using the keyword chain TITLEABS-KEY ((cbt AND model OR cognitive-behavioral AND approach OR cognitive AND therapy) AND (social AND anxiety OR social AND phobia OR social AND fear)) AND (LIMIT-TO (DOCTYPE, "ar") OR LIMIT-TO (DOCTYPE, "re") OR LIMIT-TO (DOCTYPE, "cp")). The preferred database was selected for data collection, yielding 1572 articles with a total citation count of 50621 and an average citation count of 32.2. The quantity of publications focusing on cognitive behavioral therapy for improving social anxiety showed an upward trend, as depicted in Figure 1.
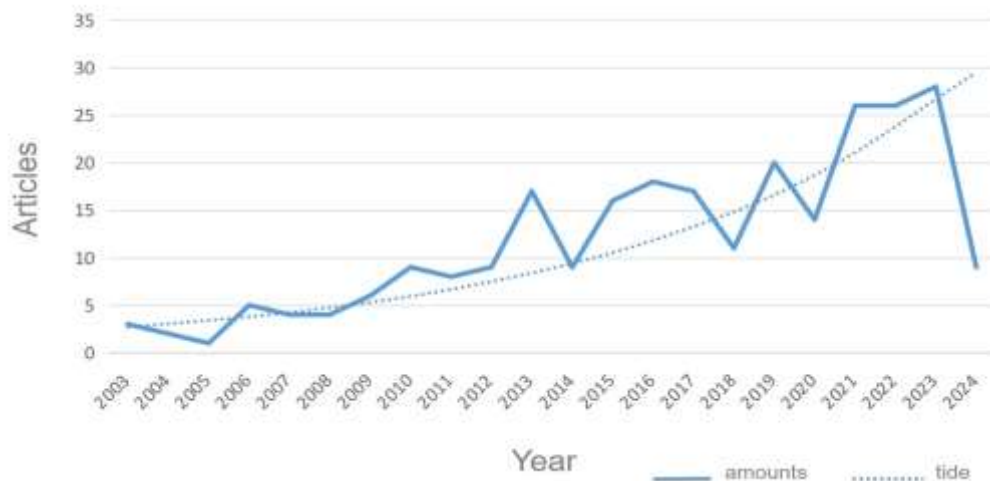


**Figure 1** Trends in publications in the field of research on treatments for social anxiety disorders within the theoretical perspective of cognitive behavioural therapy from 2003 to 2024 (solid line: original trend, dashed line: predicted trend).

By conducting a thematic search on "cognitive behavioral" and "social anxiety," limiting the document types to Article, Review, and Conference Paper, a total of 268 documents were retrieved. These documents had a cumulative citation count of 6245, with an average citation count of 23.3. These 268 documents were then analyzed using the Bibliometrix package (http://www.bibliometrix.org/), which is an R-Tool for scientific mapping (Kumar et al., 2019). Table 2 presents a summary of the main bibliometric data collected.

Table1 comprises a total of 219 articles, 44 reviews, and 5 conference papers. To delineate subtopics within the current research domain of cognitive behavioral therapy for improving social anxiety, we selected the top 10 most cited articles from the pool of 268 articles for qualitative analysis. Quantitative and qualitative analyses of the data will be conducted in the following sections.

| Description | Results |
| --- | --- |
| Timespan | 1997:2024 |
| Sources (Journals, Books, etc) | 151 |
| Documents | 268 |
| Average citations per doc | 23.41 |
| Keywords Plus (ID) | 1872 |
| Author's Keywords (DE) | 680 |
| Authors | 1182 |
| Authors of single-authored docs | 19 |
| article | 219 |
| conference paper | 5 |
| review | 44 |

**Table1** Summary of the Main Information of Collected Bibliometric Data

### Quantitative Analysis

Analysis of Publication Years

Figure 2 illustrates the annual scientific output related to treatment approaches for social anxiety disorder from the perspective of cognitive-behavioral therapy theory published between 2013 and March 6, 2024. During this period, a total of 212 scientific outputs were identified, including 179 articles, 31 review papers, and 2 conference papers. The number of published articles increased from 17 in 2013 to 23 in 2023. There were three low points over the decade, occurring in 2014, 2018, and 2020, respectively. The distribution of literature on treatment approaches for social anxiety disorder from the perspective of cognitive-behavioral therapy can be divided into two stages. In the first stage, from 2013 to 2020, the scientific output showed fluctuating trends, while after 2020, there was a steady increase in the number of publications. Despite three declines in the number of published literature, there has been increased attention from researchers in this field after 2020.
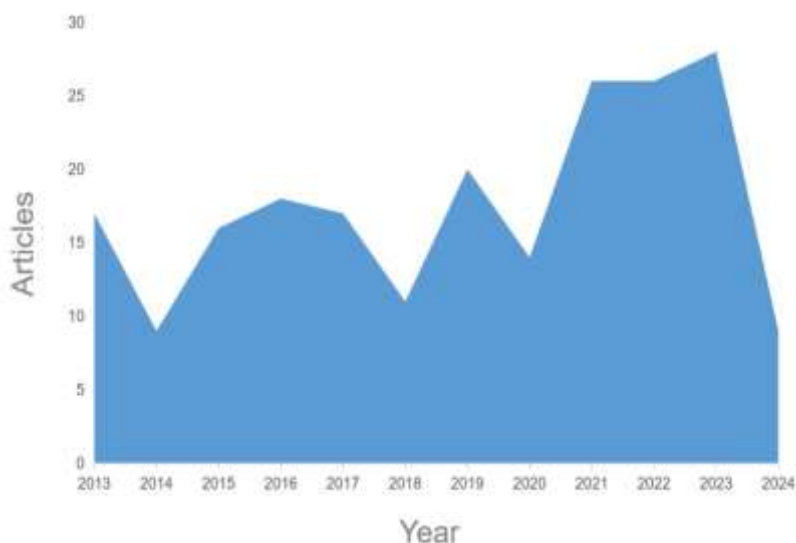


**Figure 2** Annual scientific output of quantitative and qualitative analysis of treatments for social anxiety disorders in the perspective of cognitive behavioural theory from 2013 to 2024.

Figure 3 displays the annual average citation counts of articles published between 2013 and March 6, 2024. In terms of trends, the articles published in 2015 had the highest average citation count, with 15 articles cited per year on average. The 28 articles published in 2023 had an average citation count of 1.32.
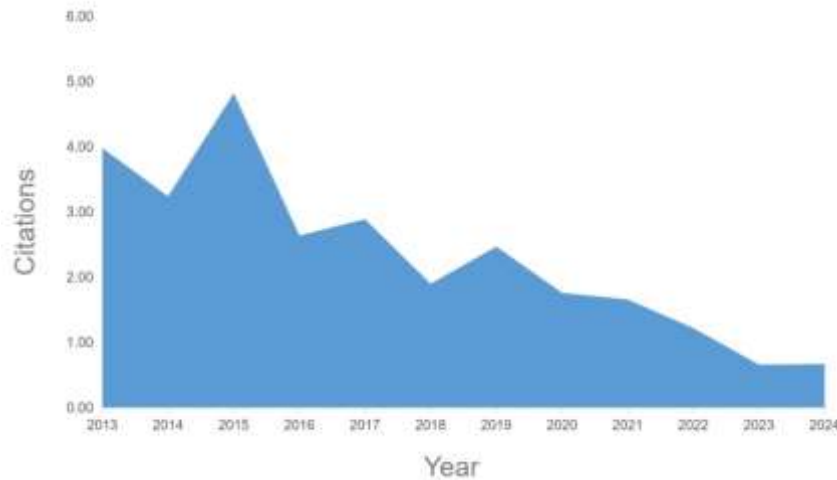


**Figure 3** Average annual citations of articles in the field of research on treatments for social anxiety disorders from a cognitive-behavioural theory perspective between 2013 and 2024.

### Analysis of Authors

From 1997 to 2024, a total of 268 research works were published in the field of treatment approaches for social anxiety disorder from the perspective of cognitive-behavioral theory. This implies that, on average, each document in our analysis set had 4.44 authors and 4.98 co-authors. Figure 4 illustrates the works of the most relevant authors from 2006 to 2024. The red line represents the timeline of the authors. Hofmann SG and Rector NA both published 5 articles in the field of treatment approaches for social anxiety disorder from the perspective of cognitive-behavioral theory between 2006 and 2024. Among other authors, the timeline of the authors is the longest. The size of the bubbles is related to the number of documents published in those years. The intensity of bubble color is also related to the total citation count each year. Olatunji, B.O published the most highly cited paper in this field in 2010, with 346 citations. According to the chart, an increasing number of researchers are delving into this area of interest.
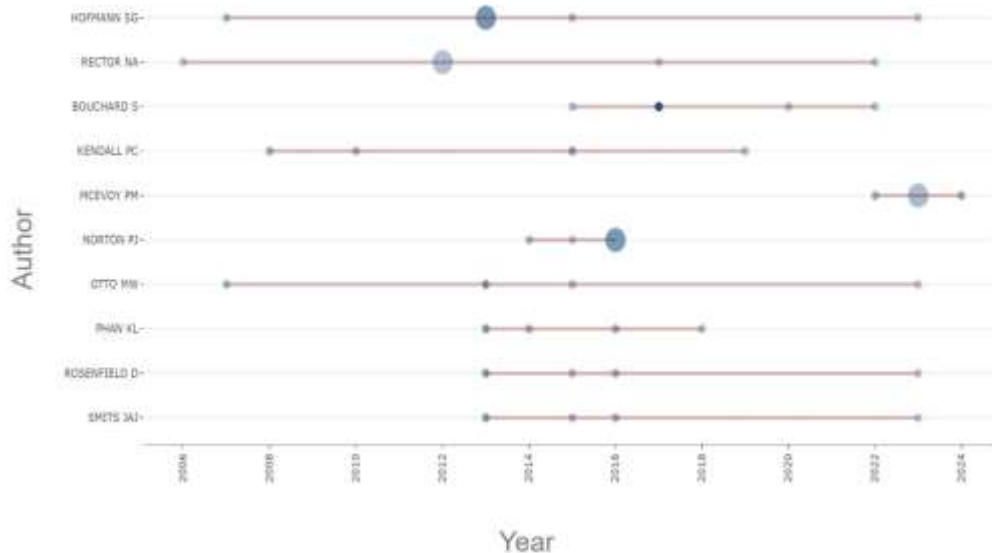


**Figure 4** Results of the 10 most relevant authors in the field of therapeutic approaches to social anxiety disorders from a cognitive-behavioural theory perspective, from 2006 to 2024 (red line: authors' timeline; size of bubbles: number of publications; intensity of bubble colour: total number of citations per year).

### Analysis of Sources

In this section, there are a total of 151 publication sources, including journals, books, conference proceedings series, and others. Figure 5 illustrates the most relevant sources used in publications applied to the field of treatment approaches for social anxiety disorder from the perspective of cognitive-behavioral theory. Each

publication source has published one or more documents within the analysis set. Clinical Case Studies emerges as the top key journal in the field of treatment approaches for social anxiety disorder from the perspective of cognitive-behavioral theory, having published approximately 12 articles between 2009 and 2024. The Journal of Anxiety Disorders comes in second, with 8 articles published. There are 9 journals that have published more than five articles in this area. These journals are crucial for researchers in improving the field of social anxiety, serving as their preferred outlets for publishing papers.
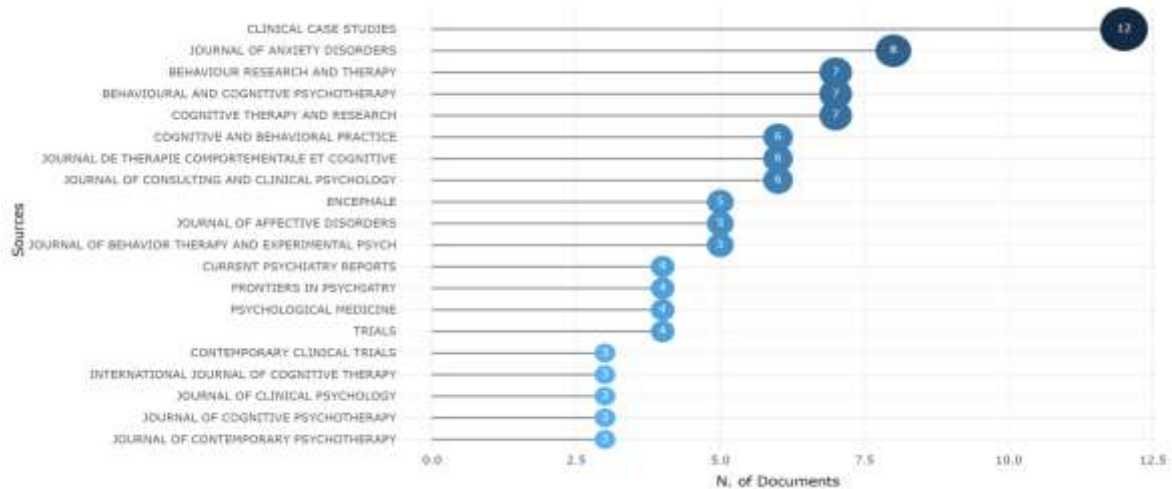


**Figure 5** Top 20 most relevant sources according to the amount of published literature on research on treatment approaches used for social anxiety disorders from a cognitive behavioural theory perspective.
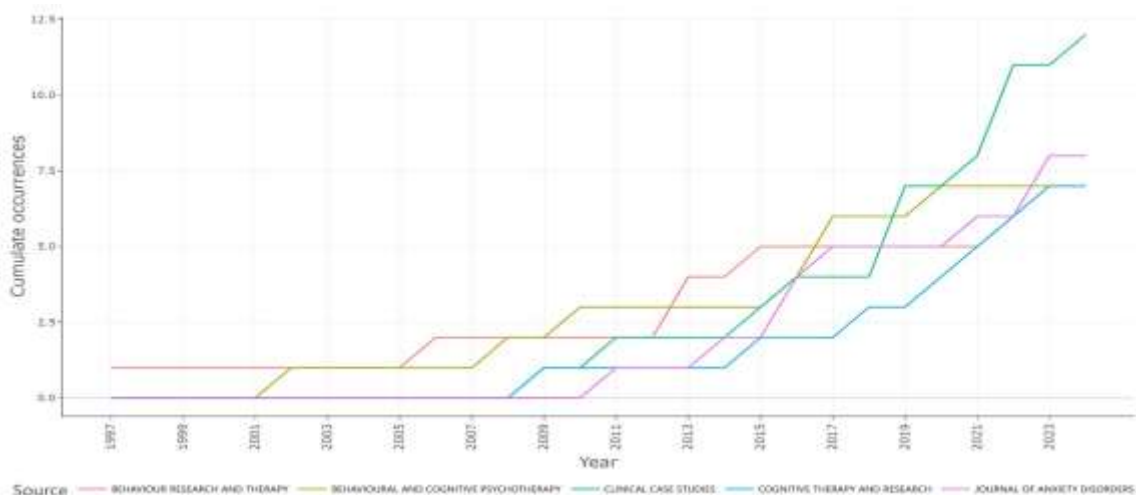


**Figure 6** Annual occurrences of the five most relevant sources in the field of treatment approaches for social anxiety disorders from a cognitive behavioural theory perspective between 1997 and 2023.

Figure 6 depicts the number of publications by source between 1997 and 2024. The graph illustrates the top dynamic sources in the field of cognitive-behavioral theory and social anxiety disorder. Over time, there has been an increase in annual publications in the top journals. Additionally, the growth of Behavior Research and Therapy slowed down after 2015. Today, Clinical Case Studies leads in publishing relevant articles. The Journal of Anxiety Disorders, as the longest-standing publication among these five sources, has steadily risen to become the second-largest relevant source in the field of cognitive-behavioral theory and social anxiety disorder after 2023.

### Analysis of Countries
In the field of treatment approaches for social anxiety disorder from the perspective of cognitive-behavioral theory, there are 268 papers distributed across 38 countries. In Figure 7, the top 20 countries are ranked based on research output. The red line represents the publication rate of authors from the respective country, while the blue line represents the number of publications by authors from the same country. These publications are categorized as multi-country collaborative publications (MCP) and single-country publications (SCP). The United States with 65 papers, Canada with 22 papers, and the United Kingdom with 21 papers are considered the top three most relevant countries. Thus far, the United States has the highest level of international collaboration.
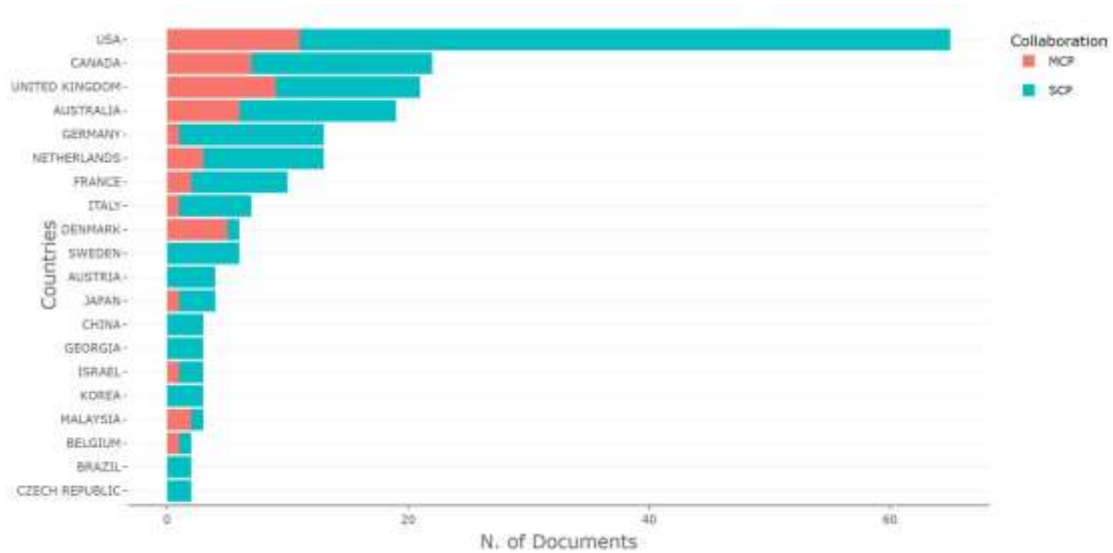
**Figure 7** Top 20 corresponding author's country (red line: Multiple Countries Publication (MCP), blue line, Single Country Publication (SCP)).

Figure 8 presents a comprehensive overview of the number of relevant authors from each country. Figure 9 illustrates the number of collaborative publications by top-ranking countries in the field of cognitivebehavioral theory and treatment approaches for social anxiety disorder. In both figures, the intensity of blue is proportional to the number of affiliated authors from each country. Each shade of blue represents the number of relevant authors, ranging from the highest of 256 authors in the United States to as few as one author in countries like New Zealand. The United States and the United Kingdom emerge as two central research powerhouses in the field of cognitive-behavioral theory and treatment approaches for social anxiety disorder. Canada and Australia follow as the second-ranking countries. The thickness of the red lines in Figure 9 corresponds to the number of collaborative publications between countries. The thickest lines in each red link between countries represent the highest number of joint publications, ranging from seven joint publications between the United States and Canada to the lowest thickness representing one joint publication between Australia and Sweden. As shown in Figure 9, Canada and the United States have a high rate of collaboration in scientific output. Overall, the United States appears to be a central country for any publication, as there are numerous scientific connections between the United States and other countries.
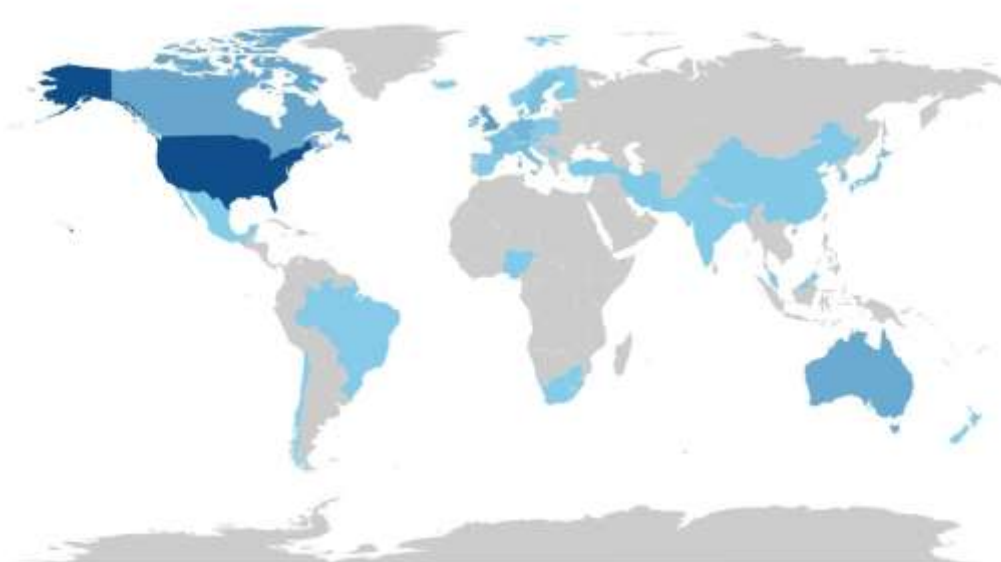


**Figure 8** World map of national scientific production used in the field of therapeutic approaches to social anxiety disorders from a cognitive-behavioural theoretical perspective (blue intensity: number of authors affiliated to each country, grey: non-relevant countries)

**Figure 9** World map of country collaborations on social anxiety therapy publications used for the cognitive behavioural therapy perspective (blue intensity: number of authors affiliated to each country, grey: unrelated countries, red line thickness: number of joint publications).

### Analysis of Topics

To analyze the main themes of publications on treatment methods for social anxiety disorder from the perspective of cognitive-behavioral theory, keyword network analysis was applied. The keyword network represents co-occurrences between datasets of bibliographic data. It may highlight different themes through clustering of the keyword network. Each keyword belongs to only one theme. The thematic map represents specific plotting charts for each theme. Figure 10

displays the themes in the research field of treatment methods for social anxiety disorder from the perspective of cognitive-behavioral theory. Each bubble represents a cluster of keyword networks. The cluster names are the most prevalent words. Therefore, "social anxiety disorder," "CBT," "cognitive behavioral therapy," "social phobia," "anxiety," "anxiety disorders," and "social anxiety" are the most relevant thematic indicators. The size of the bubbles corresponds to the frequency of occurrence of clustered words, while the position of the bubbles depends on the centrality and density of the clusters. Centrality and density respectively indicate the importance and improvement of themes in the field of treatment methods for social anxiety disorder from the perspective of cognitive-behavioral theory. Therefore, highly developed and isolated themes are situated in the top left, transitional themes in the top right, emerging or declining themes in the bottom left, and primary and lateral themes in the bottom right of the figure. Keywords such as "autism," "child; adolescent," and "cognitive-behavioral therapy (CBT); comorbidity; psychosis" represent three clusters with relatively fewer occurrences. They are termed as highly developed and isolated themes because of their lower importance and higher improvement potential. On the other hand, keywords like "anxiety disorders," "cognitivebehavioral therapy," "social phobia," "CBT," and "exposure therapy" represent five clusters termed as core and lateral themes. The keywords related to "anxiety disorder" and "cognitive-behavioral therapy" are the most significant themes, possessing the highest centrality. Moreover, they are also the most frequently occurring keyword themes, indicating their potential for future research.



**Figure 10** Thematic map of keyword network clusters in the field of research on treatments for social anxiety disorders from a cognitive behavioural theory perspective (bubble size: number of occurrences of cluster words).

## Analysis of Keywords

To provide a general overview of the article's keywords relating to cognitive-behavioral therapy and social anxiety, three diagrams were created. Figures 12 and 13 display diagrams focusing primarily on the top keywords. Figure 11 was formed by selecting three main metadata fields, with keywords as the middle field, authors as the left field, and sources as the right field. It illustrates the relationships between top keywords, top authors, and top journals. As depicted in Figure 11, authors such as Hofmann SG, Kendall PC, Rosenfield D, Smits JAJ, Rector NA, Norton PJ, Otto MW, Mcevoy PM, Bouchard S, and Phan KL have utilized almost every top keyword in their publications. Top relevant keywords such as "social anxiety disorder," "CBT," "cognitive behavioral therapy," "social phobia," "anxiety," "anxiety disorders," and "social anxiety" are the most frequently used. Moreover, these keywords are predominantly found in the top journals' articles. Sources such as Clinical Case Studies, Journal of Anxiety Disorders, Behaviour Research and Therapy, Behavioural and Cognitive Psychotherapy, and Cognitive Therapy and Research are among the top journals publishing articles on cognitive-behavioral therapy and social anxiety.



**Figure 11** Three-field diagram of the relationships between top keywords (middle field), top authors (left field) and top journals (right field) used for the Cognitive Behavioural Theory perspective on treatments for Social Anxiety Disorder publications.

Figure 12 was created by selecting three additional metadata fields, with "keywords plus" as the middle field, authors as the left field, and sources as the right field. It illustrates the relationships between top "keywords plus," top authors, and top journals. "Keywords plus" are words or phrases that frequently appear in the titles of referenced articles and are generated automatically by computers. In Figure 12, compared to Figure 11, more authors mention more keywords plus. Analyzing these popular "keywords plus" represents the hot research topics in the field of treatment methods for social anxiety disorder from the perspective of cognitive-behavioral theory, helping readers to identify the forefront of research.

As shown in Figure 12, keywords plus such as "human," "female," "fear," "male," "cognitive behavioral therapy," and "cognitive therapy" appear in almost every publication, with each top author having used them in their articles with a large number of publishers. Authors such as Phan KL, Klumpp H, Knoop H, Kendall PC, and Ollendick TH have published articles with "child" as a keyword plus.



**Figure 12** Three-region plot of the relationship between top keywords plus (middle region), top authors (left region), and top journals (right region) in publications on treatments for social anxiety disorders from a cognitive-behavioural theory perspective.

Figure 13 presents the conceptual structure of the publication set, displaying the relationships between keywords. The two dimensions of the map represent the average positions of articles containing each keyword, with the midpoint of the map representing the center of cognitive-behavioral therapy from the perspective of

treating social anxiety disorder. In the conceptual structure diagram, words from each document are linked through a network. This co-word network structure helps readers understand the topics covered in the research field and discover the forefront of research (hotspots, new hotspots). As shown in Figure 13, each color represents a cluster of words known through classification clustering. Therefore, keywords are divided into two categories. The blue cluster consists of six keywords, including "pharmacotherapy," "anxiety disorder," "cognitive behavioral therapy (CBT)," "panic disorder," "obsessive-compulsive disorder," and "specific phobia." Almost all keywords in this cluster are far apart from each other. On the other hand, the red cluster contains 64 keywords, making it more prominent than the blue cluster. Keywords such as "cognitive behavioral therapy (CBT)," "mindfulness," "virtual reality," "anxiety," "therapy," and "social phobia" are closely located within this cluster.
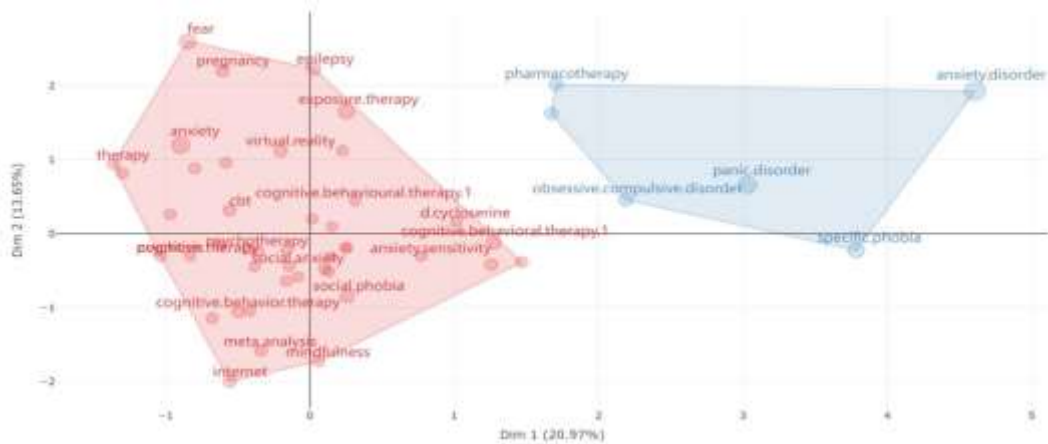


**Figure 13** Conceptual structure of the keywords used for publications on treatments for social anxiety disorders from a cognitive-behavioural theory perspective (Dim.1 and Dim.2: average position of articles included in each keyword).

Figure 14 displays another type of keyword conceptual structure diagram, known as a dendrogram. The diagram contains the same information as Figure 13 but presents it in a different view. Similarly, the conceptual structure dendrogram shows two sets of keywords. The height measures the distance between words or clusters of words. Each dendrogram describes a partition while splitting at the right position. Distant words are keywords from different topics and are typically not contained within the same article.



**Figure 14** Dendrogram of the conceptual structure of the keywords (height: distance between word clusters) used for the publication of treatments for social anxiety disorders from the perspective of cognitive behavioural theory.

Sometimes, readers need to quickly grasp the most prominent terms in their research field. A word cloud is a visual representation of keyword metadata that provides instant annotations of top words. Popular keywords plus, popular author keywords, popular title words, and popular abstract words are shown in Figures 16-19, respectively. Keywords plus are extracted from the titles of referenced articles. These words can reflect the depth of the article's content. Author keywords are selected from the authors' perspective, forming a list of words suitable for the article. This analysis generated a total of 240 keywords and 60 author keywords. While keywords plus and author keywords have similar effects in exploring knowledge from bibliometric analysis, author keywords are more inclusive in providing topics. Top title and abstract words are derived from abstracts or titles, without any punctuation or trivial terms such as "paper," "study," "work," "data," etc. Figure 15 displays the keywords plus in the field of treatment methods for social anxiety disorder from the perspective of cognitive-behavioral therapy from 1997 to 2024. The font size or color of these words reflects their importance. The figure lists keywords plus with frequencies ranging from 230 to 25. "Cognitive behavioral therapy," "treatment outcome," "cognitive therapy," and "anxiety" are the top-ranked terms and are also the optimal keywords in our research field.



**Figure 15** Word cloud of popular keywords used for the Cognitive Behavioural Theory Perspective on Treatment Approaches for Social Anxiety Disorder publication (font size: number of word occurrences).

Figure 16 presents the author keywords, ranging from appearing 46 times to as few as 4 times. These include "cognitive behavioral therapy," "CBT," "anxiety disorder," "cognitive-behavioral therapy," "social phobia," and "anxiety." In Figure 17, words appearing in titles are shown, with "cognitive," "behavioral," "therapy," "treatment," and "disorder" being the most relevant keywords. The occurrence of title words ranges from 93 times to 6 times. Figure 18 displays words appearing in abstracts, with "cognitive," "patients," and "disorder" being the most common. Abstract keywords in topic-related publications range from the word "cognitive" at 304 occurrences to "pharmacotherapy" at 12 occurrences. Interestingly, the first two or three numbers come directly from the terms used to collect the data. Overall, it is surprising that the word clouds of author, title, or abstract keywords do not follow the pattern of keyword plus word clouds. Therefore, authors should pay attention to using more relevant words in the titles, abstracts, or keywords of their publications, as indicated by the keyword plus word cloud.



**Figure 16** Word cloud of top author keywords (font size: number of word occurrences) used for the Cognitive Behavioural Theory Perspective on Treatment Approaches to Social Anxiety Disorder publication.

**Figure 17** Word cloud of popular headline words (font size: number of word occurrences) used in publications on treatment approaches to social anxiety disorder from a cognitive-behavioural theory perspective.



**Figure 18** Word cloud of top abstract words (font size: number of word occurrences) used for publications on treatments for social anxiety disorders from a cognitive-behavioural theory perspective.

Figure 19 depicts the number of popular keywords in the field of treatment methods for social anxiety disorder based on the cognitive-behavioral theory perspective from 1997 to March 6, 2024. From 1997 to 2017, the topic of "cognitive theory" experienced rapid growth, reaching a stable level of 182 occurrences per year after 2017. In recent publications, keywords such as "HUMAN," "FEMALE," "FEAR," "MALE," and "COGNITIVE BEHAVIORAL THERAPY" have become increasingly prominent. The number of most frequently used keywords each year is increasing, indicating the expansion of research on these topics.



**Figure 19** Number of annual occurrences of popular keywords used in the treatment approach for social anxiety disorders from a cognitive-behavioural theory perspective between 1997 and 2024 (method: loess smoothing).

## Conclusion

The bibliometric analysis employs mathematical and statistical methods to evaluate academic achievements. This paper provides a detailed analysis of bibliometric studies on "cognitive-behavioral theory" and "social anxiety." The focus of this work is to conduct bibliometric analysis on theme-related literature from 1997 to March 2024 using the SCOPUS database. The results indicate an increasing number of scholars engaging in research on cognitive-behavioral theory and the treatment of social anxiety disorder, thereby promoting the development of the discipline.

Due to the publication volume reaching turning points in 2013, 2018, and 2020, there has been a downward trend in research literature on "cognitive-behavioral theory" and "social anxiety" during these years. However, the overall level has shown an upward trend, reaching its peak of 28 articles in 2023. Researchers from the United States, United Kingdom, Canada, Australia, and the Netherlands have made the largest contributions to publications. The United States and the United Kingdom rank first and second, respectively, in terms of paper output. "Clinical Case Studies" and "Journal of Anxiety Disorders" are considered the most relevant journals in the field of treatment methods for social anxiety disorder from the perspective of cognitivebehavioral theory. Representative keywords in our publication set include "cognitive behavioral therapy," "CBT," "anxiety disorder," "cognitive-behavioral therapy," "social phobia," and "anxiety."

It is expected that the results of this work will provide a better vision for future research directions and clarify the research directions in the fields of "cognitive-behavioral theory" and "social anxiety" for future researchers, laying the groundwork for deeper research.

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