

Evolution and Research Trends in Psychosexual From 2000-2024: A Bibliometric Analysis

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Abstract

Psychosexual research has emerged as a cornerstone domain within psychology, medicine, and the social sciences, owing to its far-reaching implications for both individual well-being and broader societal dynamics. This multifaceted construct encompasses an intricate interplay of perceptions, emotional responses, attitudinal dispositions, and behavioral manifestations in the sexual context. Despite the field's significance, there exists a notable absence of comprehensive systematic analyses documenting its evolutionary trajectory and current state of knowledge. To address this significant gap in the literature, we conducted an extensive bibliometric analysis encompassing 1,365 psychosexual-related articles indexed in the Web of Science Core Collection spanning from 2000 to 2024. Our methodological framework incorporated multiple analytical dimensions, including temporal publication patterns, geographical and institutional distribution networks, co-citation analyses, subject area categorizations, and longitudinal keyword evolution patterns. The findings illuminate the fundamental architecture and developmental trajectory of psychosexual research, delineating key contributing nations, centers of academic excellence, and distinct thematic clusters within the field. Moreover, the analysis revealed emerging research frontiers and identified critical knowledge gaps requiring scholarly attention. This systematic investigation provides an empirically grounded assessment of the academic landscape, offering valuable insights into the structural dynamics and theoretical underpinnings of psychosexual research. The study serves as an essential resource for researchers and practitioners, providing strategic direction for future investigations by highlighting underexplored territories and fostering a more nuanced understanding of both theoretical frameworks and practical applications.

Keywords: Bibliometrics, Cite Space, Evolution, Psychosexual, Trends

Introduction

Psychosexual has always been an important area of research in the field of sexual health. The World Health Organization (WHO) suggests that sexual health is a state of physical, emotional, mental, and social well-being related to sexuality; it is not merely the absence of disease, dysfunction, or infirmity (1). The concept of sexual well-being can be defined as the maintenance of physical, emotional, mental, and social well-being, encompassing more than the lack of disease (2). It is evident that psychosexual is also an important predictor of sexual health. Psychosexual is a multidimensional and complex concept that involves aspects of an individual's perceptions, emotions, attitudes, and sexual behaviors (3, 4). First, psychosexual plays a key role in the formation of individual identity and self-concept. Some studies have shown that an individual's experience of gender identity and sexual

orientation can have a profound impact on his or her self-concept and social interactions (5, 6). Second, an individual's psychosexual state affects his or her interactions and social relationships with others (7). Influencing the individual's relationships with family, friends, colleagues (8, 9). It has been shown that socio-sexual can be further divided into 3 components: past behavioral experiences, attitude toward uncommitted sex, and socio-sexual desire, each affecting courtship and romantic relationships differently (10). Healthy psychosexual states are also closely related to emotional health (11). Psychosexual distress or conflict may lead to emotional problems such as anxiety and depression. At the same time, positive psychosexual experiences and relationships contribute to an individual's emotional fulfillment and well-being. Finally, psychosexual plays a driving role in the maturation

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and development of the individual (12). Psychosexual development during adolescence and adulthood is closely linked to physical development and cognitive development (13, 14). Different individuals have unique experiences with psychosexual (15, 16). At the same time, psychosexual is also influenced by culture and even religion (17). Academic research on the psychosexual has been carried out from multiple perspectives, and there is no uniform definition of the psychosexual due to different dimensions of research. Most scholars recognize that psychosexual is not just about the physical act of sex but also about the emotional and psychological aspects of sexuality (18, 19). Psychosexual development is intertwined with the overall development of the individual and has a non-negligible role in physical and mental health and social adjustment (20, 21). Understanding and promoting positive psychosexual development contributes to the realization of more comprehensive individual health and well-being. Currently, the research methods of sexual psychology are mainly based on empirical research. Most of the studies are cross-sectional studies, which mainly explore the factors affecting psychosexual. There are few longitudinal studies, intervention studies and cross-cultural studies. However, it is rare to explore the trends and hot topics of psychosexual research through bibliometric research. This study aims to analyze the development trends, research hotspots, and intellectual structure of psychosexual research from 2000 to 2024 using bibliometric methods. By examining publication outputs, keyword co-occurrence, co-citation networks, and clustering patterns, the study seeks to provide a comprehensive overview of the field's evolution and future directions (22). Through the use of statistical and mathematical methods, bibliometrics aims to provide an in-depth understanding of the structure, dynamics, and impact of the academic field, thereby providing researchers with an objective and systematic method of assessment. The methodology usually includes the analysis of several aspects of the literature, such as citations, authors, institutions, and topics, in order to reveal patterns of disciplinary development, research hotspots, and cutting-edge issues (22, 23). Using CiteSpace as the main research tool, we explored the trajectory and

development of psychosexual research from multiple perspectives by analyzing the countries, institutions, literature co-citation and cluster analysis, discipline co-occurrence and cluster analysis, and keyword clustering of the literature published in the last 20 years of psychosexual research. It provides a more objective and systematic assessment method for research related to psychosexual, helps researchers in related fields to better understand the structure and dynamics of the academic field, and provides decision support and reference basis for scientific research.

Methodology

Data Collection

The data for this study was obtained from the Web of Science (WOS), which is a scholarly literature search tool and database provided by Clarivate Analytics. It is a comprehensive citation-indexed database covering scholarly literature in a variety of subject areas, including the natural sciences, social sciences, and humanities. Web of Science is widely used in academic research, research assessment, and scholarly publishing, and has become one of the most important tools in the global academic community. In our research, we mainly use the core databases in WOS, including Science Citation Index Expanded (SCI-EXPANDED), Social Sciences Citation Index (SSCI), Arts and Humanities Citation Index (A and HCI), Conference Proceedings Citation Index - Science (CPCI-S), and Conference Proceedings Citation Index - Social Science and Humanities (CPCI-SSH). The search strategy for this study was TS= (psychosexual* OR "sexual psychology"* OR "psychology of sex"* OR "sex psychology"), and the type of article retrieved was "article" or "review". The time frame of the search was 2000.01-2024.01. The study was searched on January 10, 2024. Furthermore, we restricted the language to English, as WoS predominantly indexes English-language publications.

The initial search yielded 1,645 records. We applied the following inclusion criteria:

- Only journal articles and review papers were included.
- Only English-language publications were considered.
- Duplicates and irrelevant articles were manually screened and removed.

After applying these criteria, a total of 1,365 papers were selected for final analysis, consisting of 1,110

journal articles and 255 review papers (Figure 1).

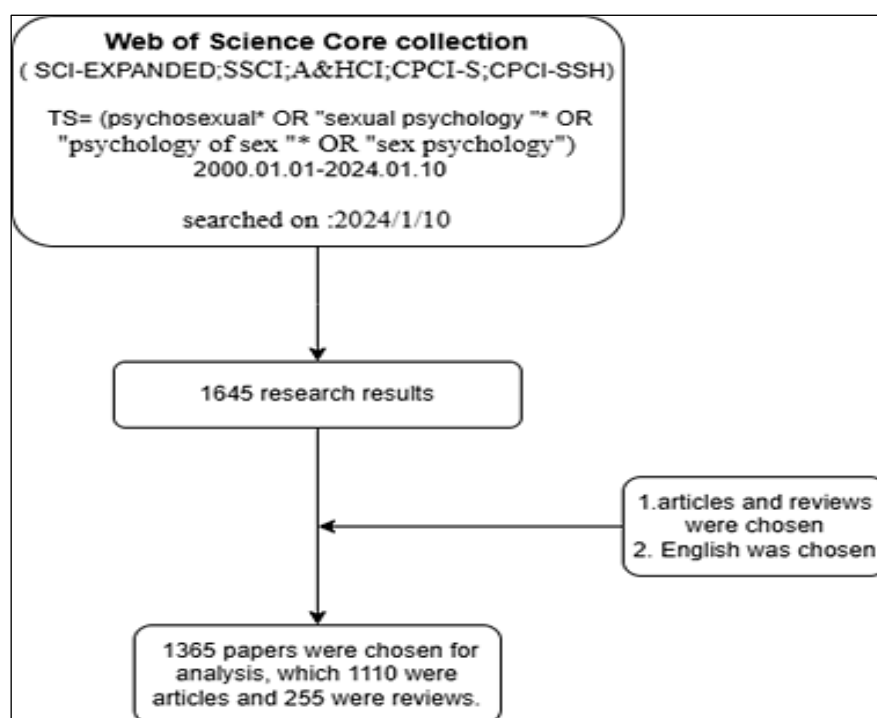


Figure 1: Flowing Chart of Literature Searching

Research Tool

The main software used in the study was CiteSpace 6.2.7 developed by Dr. Chen. CiteSpace is bibliometric analysis software, which reveals the hotspots, trends, and significant papers in the research field through co-citation analysis, clustering analysis, and timing evolution analysis of the major research institutions and authors (24, 25). CiteSpace provides researchers with a comprehensive tool for exploring relationships among academic literature, gaining insights into the dynamics of disciplines, and discovering keywords and literatures within a research field. It is an important tool for research organizations, scholars, and policymakers to understand disciplinary trends and develop research strategies (26, 27). In this study, the statistical values in CiteSpace were set as follows: select the top 50 levels of most cited or occurred items from each slice (Top N). Select the top 10% of most cited or occurred items from each slice (Top N%). The maximum number of selected items per slice was 100. To include more or fewer nodes, increase or decrease the scale factor $k=25$.

Results and Discussion

Publication Analysis

As shown in Figure 2, the number of articles published in research literatures on psychosexual has shown a certain trend during the period from 2000 to 2024. Between 2000 and 2007, the number of publications was relatively low and showed a relatively flat state. However, over time, especially after 2008, the number of research literature has shown a significant increasing trend. This may reflect an increase in research interest in the field over this time period or increased recognition of the field by the academic community. However, a relatively high level was reached in 2014 and 2015, with 73 and 78 publications per year, respectively. This may reflect a more active research activity in the field during these two years or the publication of certain important research results. In 2020 and 2022, there are some fluctuations in the number of publications, and there is a significant decrease in the number of papers published, which may be related to the global epidemic and may have an impact on the progress of some research. Notably, in 2023, there is a significant increase in the number of publications to 100, which shows a

significant increase in research activity on psychosexual in that year. This growth may have been caused by emerging themes or as a result of the widespread interest in certain key research directions.

Country Distribution

An analysis of the 371 countries to which the issuance of literatures belongs reveals that European countries dominate the field of psychosexual research. The United States is located in the country with the highest number of published psychosexual research papers with 419

publications, followed by the United Kingdom [228], the Netherlands [133], and Canada [113]. Australia, located in Oceania, is at the 5th position. In the Asian region, China [26] and India [26] dominate the research in related fields (Figure 3). Further, a network study of the issuing countries (Figure 4) reveals that the United States and European countries are still the main centers of research in the field of psychosexual constructs, and that the research on psychosexual in Asia as a whole is still relatively weak in comparison with Europe.

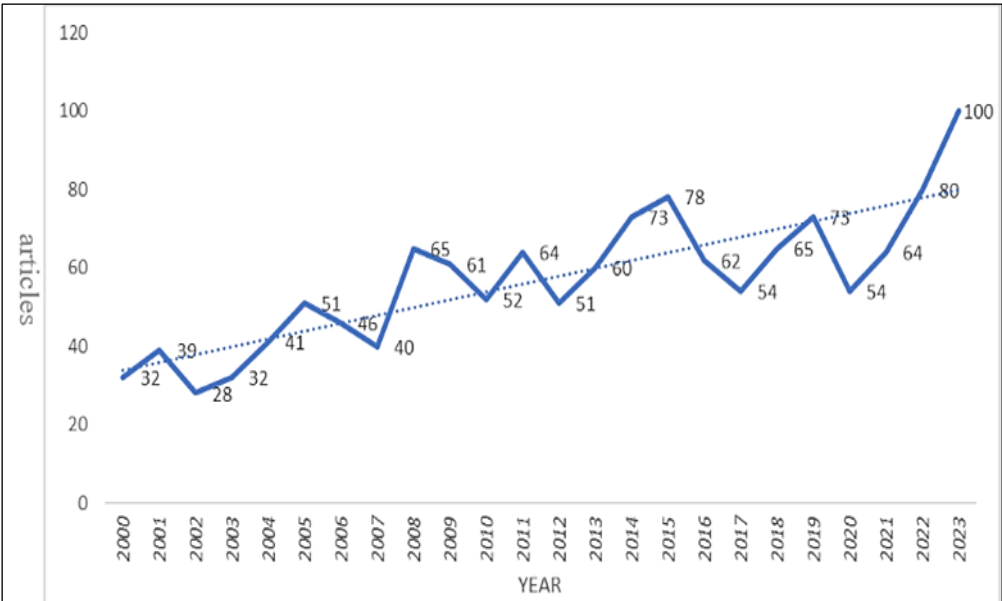


Figure 2: Trends in the Number of Publications in Psychosexual (2000~2024)

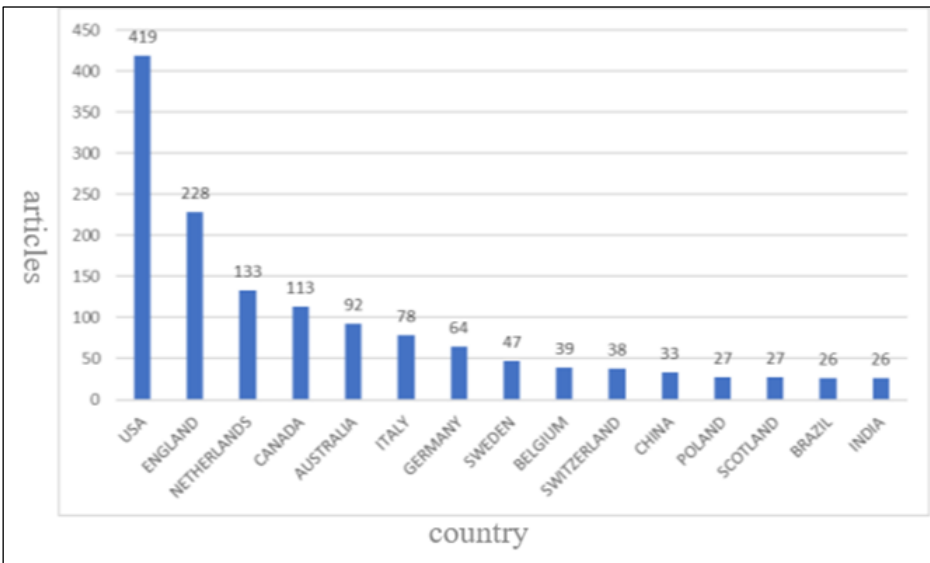


Figure 3: Top 15 Countries by Publication Count on Psychosexual (2000-2024)

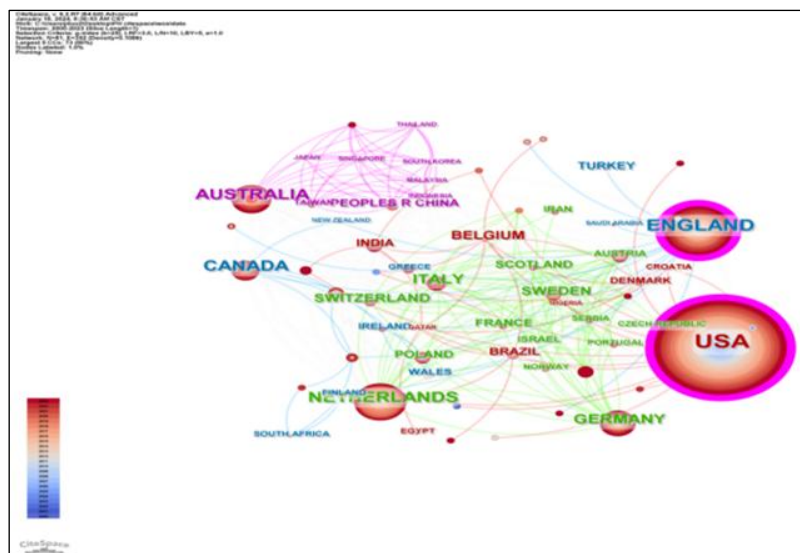


Figure 4: Countries Distribution on Psychosexual Research

Institution Distribution

This study analyzed centrality, citation and burst (Table 1) of 4016 research institutions using Cite Space. Centrality is a measure of the relative importance or central position of a node in the overall network. In Cite Space, centrality metrics are commonly used to assess the importance of authors, documents, or topics in a knowledge graph in order to help researchers discover the core nodes in the network (24, 28). According to centrality, the University of California System has the most outstanding performance, with a value of 0.13, indicating a high centrality in the overall research network. This suggests that it may play a key role in research collaboration, information dissemination, and other aspects. This was followed by the University of Texas System (0.09), Cancer Council Queensland (0.08), Harvard University (0.08), University of London (0.08), and University of Newcastle (0.08) tied for third place in the centrality ranking. This suggests that these institutions are more connected in the academic research network and may be important partners in the field, playing a key role in the research network. Citation indicates the total number of times a document has been cited (27). This metric can help determine the overall impact of a literature, as more citations usually mean that the literature has had a greater impact in the academic community (28-30). In terms of Citation analysis for research institutions, University of London tops the list with 65 citations, indicating that the institution's research output is widely cited in

academia. Vrije Universiteit Amsterdam [39] and University of California Vrije Universiteit Amsterdam [39] and University of California System [35] also performed well in terms of citations, indicating that their research outputs have a certain degree of influence in the academic field, while renowned institutions such as Harvard University [26] and Karolinska Institution [22] were also highly cited by academics, indicating that their research contributions in this field are more significant. Citation bursts reveal new trends in scientific research and point toward future directions, particularly highlighting the most notable bursts among recent trends (31). Burst analysis helps to identify literature that has had a prominent impact over a certain period of time and may represent a research hotspot in the field. Burst's data shows the prominence of an institution's research activity over a given period of time. In this regard, Ghent University tops the list with a value of 4.88, indicating a sudden increase in research activity at the institution during a particular period of time. Institutions such as Ghent University Hospital, Columbia University, etc., also show high levels at the Burst level, suggesting that their research during a particular period of time is more prominent. This suddenness may reflect the influence of specific events, research directions, or policies within the field. Institutions such as University of Sydney and Karolinska Institution also show some prominence at the Burst level, indicating that they have relatively high research activity during a given period.

Table 1: Top 10 of Institutions by Centrality, Citation and Burst

Centrality	Institutions	Country	Citation	Institutions	Country	Bursts	Institutions	Country
0.13	University of California System	USA	65	University of London	UK	4.88	Ghent University	Belgium
0.09	University of Texas System	USA	39	Vrije Universiteit Amsterdam	Netherlands	4.77	Ghent University Hospital	Belgium
0.08	Cancer Council Queensland	Australia	35	University of California System	USA	4.39	Columbia University	USA
0.08	Harvard University	USA	30	University College London	UK	4.25	Academic Medical Center Amsterdam	Netherlands
0.08	University of London	UK	30	Erasmus University Rotterdam	Netherlands	4.07	Universite de Montreal	Canada
0.08	University of Newcastle	USA	27	University of Amsterdam	Netherlands	3.91	Karolinska University Hospital	Sweden
0.07	Imperial College London	England	27	Erasmus MC	Netherlands	3.89	University of Sydney	Australia
0.05	Assistance Publique Hopitaux Paris (APHP)	USA	26	Harvard University	USA	3.76	Karolinska Institutet	Sweden
0.05	University of Sydney	Australia	22	Karolinska Institutet	Sweden	3.48	Danderyds Hospital	Sweden
0.05	Vrije Universiteit Amsterdam	Netherlands	21	University of Groningen	Netherlands	3.47	Johns Hopkins University	USA

Analysis of Published Journals

Co-citation is the frequency with which two documents are cited together by other documents. A co-citation relationship is when two papers are both cited in a third paper (32). Through an analysis of journal co-citations in the field of psychosexual research, Table 2 lists the 10 most cited academic journals in psychosexual research. Of these journals, Archives of Sexual Behavior, Journal of Sexual Medicine, and The Journal of Sex and Marital Therapy ranked the top three with 513, 509, and 403 citations, respectively. Archives of Sexual Behavior are a Springer journal that publishes scientific research on sex, gender, and sexuality. The Journal of Sexual Medicine publishes multidisciplinary basic science and clinical research aimed at defining and understanding the scientific basis of sexual function and dysfunction in men, women, and couples. As the official journal of both the International Society for Sexual

Medicine and the International Society for Research in Women's Sexual Health, it furnishes vital educational material for healthcare professionals specializing in sexual medicine. It further promotes the exchange of scientific data derived from experimental and clinical research in this domain. The Journal of Sex and Marital Therapy is one of the top journals in the field of human sexuality, which is independent of any professional organization. In addition, The Journal of Urology and The Journal of Sex Research also show a significant citation frequency of 359 and 330 citations, respectively, indicating that they have a wide range of impacts in sexual health and related fields. It is important to note that generalist medical journals such as New England Journal of Medicine and LANCET are also on this list, indicating the presence of interdisciplinary research and some influence of these journals in sexual health research.

Table 2: Top 10 of Co-Citation Journals

Co-cited	Journals	Centrality	Journals
513	Archives of Sexual Behavior	0.07	Child Development
509	Journal of Sexual Medicine	0.06	CANCER- American Cancer Society
403	The Journal of Sex and Marital Therapy	0.05	Acta Obstetrica et Gynecologica Scandinavica
359	The Journal of Urology	0.05	Fertility and Sterility
330	The Journal of Sex Research	0.05	Hormones and Behavior
266	New England Journal of Medicine	0.05	Human Reproductive
260	LANCET	0.05	The Journal of Clinical Endocrinology and Metabolism
241	The Journal of Clinical Endocrinology and Metabolism	0.05	Journal of Personality and Social Psychology
238	UROLOGY	0.05	The Journal of Sex Research
238	The Journal of the American Medical Association	0.05	LANCET

In this study, to explore the research evolving of psychosexual through the co-occurrence and cluster analysis of study subject, journal co-occurrence analysis, keyword timeline analysis.

Subject Co-Occurrence Analysis

Co-occurrence analysis is a method to reveal the relationship between elements in the literature such as keywords, authors, journals, etc. It is mainly used to identify research hotspots and trends, reveal interdisciplinary intersections, analyze academic influence, and explore research frontiers. In addition, co-occurrence analysis helps to understand the knowledge structure of the research field, provides quantitative tools for literature review, supports the generation of new research hypotheses, and promotes knowledge discovery. In conclusion, co-occurrence analysis provides a powerful tool for researchers to understand the dynamics of the academic field and conduct scientific exploration from a macro perspective. When using Cite Space to do the data analysis of the subject, the $Q=0.494$ and $S=0.890$ in the study, the study fully meets the criteria, so the study is valid (28). It can be seen that psychosexual research has a rich and diverse disciplinary coverage (Figure 5, Table 3), with Urology and Nephrology [246], Psychology and Clinical [176] dominating the research, with a high number of citations, highlighting the importance of psychosexual research in the fields of medicine and psychology. Obstetrics and Gynecology [153] and Oncology [119] also play an important role in the

research, showing the strong link between psychosexual and women's health as well as cancer-related issues. In terms of centrality, Public, Environmental and Occupational Health (0.31) has a high centrality in psychosexual research, indicating that the field plays a key role in connecting other disciplines. Oncology (0.18), Psychiatry (0.16), Psychology (0.15) are similarly significant in their centrality, demonstrating their key position in integrative psychological research. The centrality of interdisciplinary psychosexual research highlights the sexual health issues it needs to understand and address from multiple disciplinary perspectives. Finally, the rapid increase in citations in the fields of Psychiatry (5.04), Environmental Sciences (4.16), Health Care Sciences and Services (4.13) shown in the bursts study suggests that the recent focus of research may be related to mental health, environmental factors, and the new developments at the intersection of mental health, environmental factors, and psychosexual. Additionally, areas such as Psychology of Society (3.69) and Infectious Diseases (3.48) also demonstrated a significant increase in citations, suggesting that the focus of psychosexual research on psychosocial and infectious disease factors has increased in the recent past. These summaries highlight the interdisciplinary nature of psychosexual research, the multidisciplinary nature of sexual health issues, and the increased focus of recent research on emerging areas such as mental health, environmental influences, and social factors.

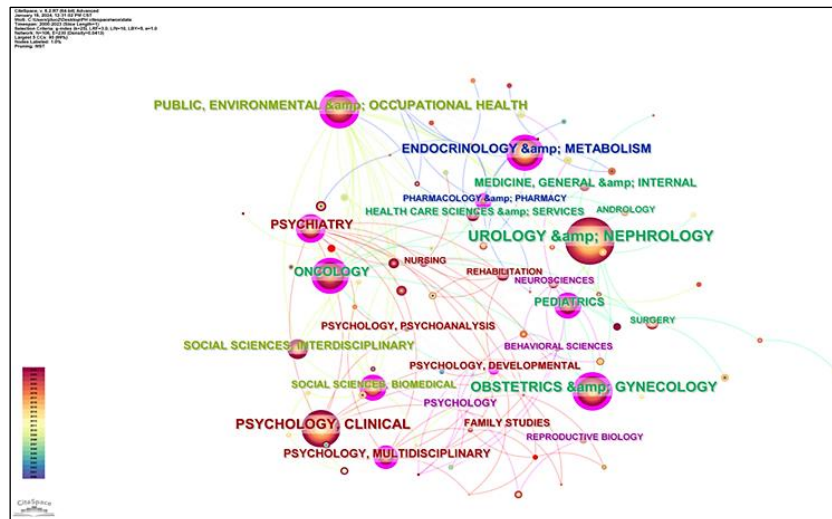


Figure 5: The Map of Co-Occurring Subject Categories on Psychosexual

Table 3: Top 10 of Subject Categories by Citation, Centrality, Bursts

Citation	Subject Categories	Centrality	Subject Categories	Bursts	Subject categories
246	Urology and Nephrology	0.31	Public, Environmental And Occupational Health	5.04	Psychiatry
176	Psychology, Clinical	0.18	Oncology	4.16	Environmental Sciences
153	Obstetrics and Gynecology	0.16	Psychiatry	4.13	Health Care Sciences and Services
119	Oncology	0.15	Psychology, Multidisciplinary	3.69	Psychology, Social
96	Public, Environmental and Occupational Health	0.14	Social Sciences, Biomedical	3.48	Infectious Diseases
96	Endocrinology and Metabolism	0.13	Pharmacology and Pharmacy	3.36	Family Studies
93	Psychiatry	0.12	Endocrinology And Metabolism	0	Public, Environmental And Occupational Health
88	Pediatrics	0.11	Obstetrics And Gynecology	0	Oncology
72	Psychology, Multidisciplinary	0.11	Pediatrics	0	Psychology, Multidisciplinary
66	Medicine, General and Internal	0.1	Health Care Sciences and Services	0	Social Sciences, Biomedical
64	Social Sciences, Interdisciplinary	0.09	Surgery	0	Pharmacology And Pharmacy
54	Social Sciences, Biomedical	0.08	Psychology, Developmental	0	Endocrinology And Metabolism
44	Family Studies	0.08	Medicine, Research And Experimental	0	Obstetrics And Gynecology
37	Psychology	0.07	Psychology	0	Pediatrics

37	Psychology, Developmental	0.07	Neurosciences	0	Surgery
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Subject Cluster Analysis

The study showed through clustering analysis of psychosexual disciplines (see Table 4) that Cluster 0 and Cluster 4 highlight the fact that psychosexual research is active at the intersection of the social sciences, which includes the social sciences, psychology (especially clinical psychology), and environmental sciences. These fields demonstrate a high clustering effect, emphasizing the importance of psychosexual research in exploring social-individual relationships, mental health, and so on. Next, Cluster 1, Cluster 2, Cluster 3, and Cluster 5 combine the study of psychosexual research with the field of medicine, emphasizing concerns in the medical fields of urological sciences, internal medicine, pediatrics, obstetrics and gynecology, and cancer treatment. These clusters reflect the deep connection between psychosexual and physical health and medical treatment. Third, the interdisciplinary nature and the rise of emerging fields: Cluster 6, Cluster 7, and Cluster 8 indicate the gradual integration of

psychosexual research into the humanities (e.g., linguistics, literature) as well as cross-cutting fields (e.g., nursing, communication). This demonstration the increased interdisciplinary nature of psychosexual research and also highlights the focus on emerging areas, such as the intersection of psychology and linguistics. Finally, Cluster 9 and Cluster 10 correspond to more recent years, but it is difficult to clearly summarize their characteristics at this time due to poor clustering. However, this may also be indicative of the broader exploration of the latest research trends in multidisciplinary fields, and more research is needed to understand their specific directions and characteristics. The summary of these disciplinary clustering characteristics suggests that psychosexual research is characterized by diversity and richness in interdisciplinary collaborations, medical fields, and emerging areas of development. This not only emphasizes the complexity of psychosexual research, but also provides broader directions for future research.

Table 4: The Largest 11 Clusters of Subject Categories in Psychosexual

Cluster ID	Size	Silhouette	Mean (Year)	Label (LLR)
0	18	0.986	2007	Social Sciences, Interdisciplinary (170.55); Psychology, Clinical (160.12); Public, Environmental And Occupational Health (64.94,); Urology And Nephrology (28.35); Environmental Sciences (28.13)
1	16	0.872	2002	Psychiatry (77.52, 1.0e-4); Neurosciences (65.5); Behavioral Sciences (60.27); Clinical Neurology (58.03); Psychology, Biological (32.28)
2	14	0.847	2002	Urology And Nephrology (168.61); Medicine, General And Internal (95.09); Health Care Sciences And Services (50.15); Health Policy And Services (32.22); Andrology (29.72)
3	12	0.936	2005	Oncology (85.19); Surgery (72.57,); Pediatrics (72.46); Hematology (39.73); Psychology, Clinical (17.39)
4	12	0.834	2004	Psychology, Multidisciplinary (69.61); Womens Studies (60.69); Psychology, Social (46.37); Criminology And Penology (45.82); Family Studies (27.58)
5	12	0.911	2007	Obstetrics And Gynecology (140.13); Reproductive Biology (100.85); Endocrinology And Metabolism (46.45); Medicine, Research And Experimental (31.29); Geriatrics And Gerontology (27.34)

6	3	1	2010	Humanities, Multidisciplinary (22.92); Communication (11.12); Linguistics (11.12); Urology And Nephrology (0.52); Psychology, Clinical (0.5)
7	3	0.952	2005	Nursing (59.5); Cardiac And Cardiovascular Systems (8.14); Respiratory System (4.39); Oncology (3.92); Urology And Nephrology (2.09)
8	3	1	2004	Literature (21.74); Language And Linguistics (21.74) ; Literary Theory And Criticism (10.62); Urology And Nephrology (0.65); Psychology, Clinical (0.62)
9	1	0	2021	Integrative And Complementary Medicine (15.62); Urology And Nephrology (0.13); Psychology, Clinical (0.12); Social Sciences, Interdisciplinary (0.12); Public, Environmental And Occupational Health (0.11)
10	1	0	2018	Literature, German, Dutch, Scandinavian (15.62); Urology And Nephrology (0.13); Psychology, Clinical (0.12); Social Sciences, Interdisciplinary (0.12); Public, Environmental And Occupational Health (0.11)

Journal Co-Occurrence Analysis

By analyzing the co-occurrence relationship between different journals, we can reveal the knowledge structure of a specific research field and understand the connections and interactions between different subfields. A network analysis of the centrality of co-citation journals shows that the journals Child Development and CANCER-American Cancer Society have high centrality, 0.07 and 0.06, respectively. As the flagship journal of the Society for Research in Child Development (SRCD), Child Development has been publishing articles, essays, reviews, and tutorials on various topics in child development since 1930. This suggests that they are relatively central to the overall citation network and may play a key role in integrating

different areas of research. In addition, multiple journals, such as The Journal of Clinical Endocrinology and Metabolism (0.5), Journal of Personality and Social Psychology (0.5), The Journal of Sex Research (0.5), and LANCET (0.5), all had similar levels of centrality, suggesting that they have a high degree of relevance and cross-influence across the citation network. These journals are likely to be highly connected across the research field and play a key role in knowledge integration (Figure 6). Psychosexual research is becoming more inclusive and encompasses a variety of approaches and perspectives, including a combination of qualitative and quantitative research, as well as research in different cultural contexts.

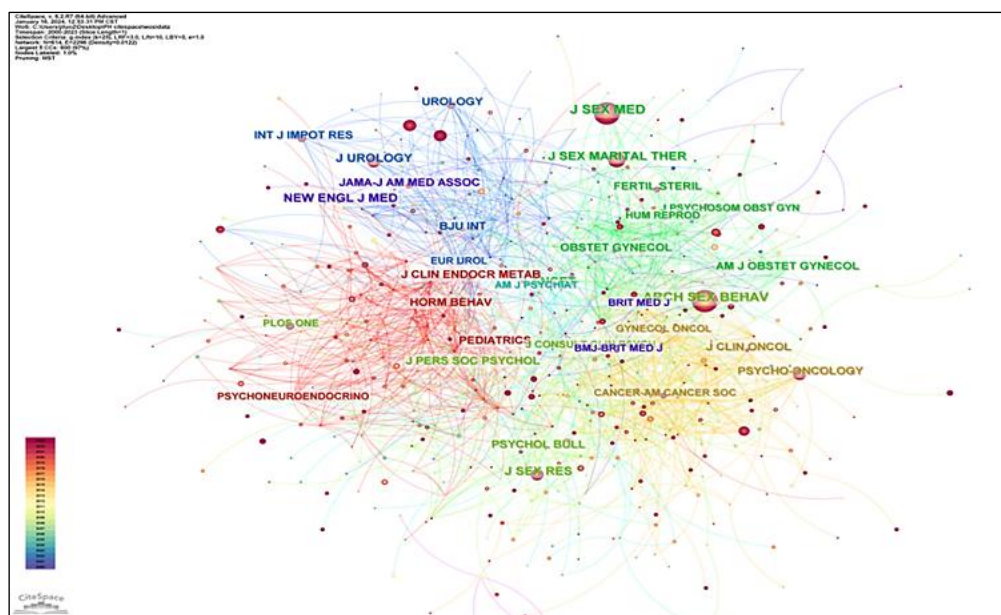


Figure 6: Co-Citation Journals Network of Psychosexual

Co-Citation Literature Analysis

In this study, we analyzed the co-citation literature (Nodes=1022, Links=3389), and listed the top ten co-cited literatures (Table 5). The highest cited articles with 72 citations was the "Diagnostic and Statistical Manual of Mental Health Disorder (5th)" from the American Psychiatric Association (APA). The "Diagnostic and Statistical Manual of Mental Health Disorder (5th)" is a diagnostic and statistical manual of mental health disorders by the APA. It is one of the most widely used classification systems in psychiatry for standardizing the diagnosis of mental disorders to help clinicians, researchers, and other professionals understand and diagnose mental disorders more consistently in practice. Due to its wide acceptance and adoption, it has become a reference tool for clinicians, researchers, and other related professionals. It has had a profound impact on the development of the field of psychiatry, making it an authoritative text in the field of psychiatry (33). The second most cited literature is "Statistical Power Analysis for the Behavioral Sciences" by Jacob Cohen, 2013 (34). It provides a comprehensive introduction to the issue of statistical efficacy in research design and is a

classic reference book widely used in various fields such as psychology, education, sociology, and various other fields of research (34). The third most cited article is "Dyskinesias, Tics, and Psychosis: Issues for the Next Diagnostic and Statistical Manual of Mental Disorders" by Mittal VA, and Walker EF, 2011 (35). This paper raises a number of questions about movement disorders, psychiatric classification, and future research directions. It provides a discussion of possible improvements in the DSM-V (35). The fourth most cited article is "Androgen and Psychosexual Development: Core Gender Identity, Sexual Orientation, and Recalled Childhood Gender Role Behavior in Women and Men with Congenital Adrenal Hyperplasia (CAH)" by Hines *et al.*, 2004 (36). It focuses on the effects of androgens on human psychosexual development, particularly in relation to gender identity and sexual orientation (36). The next highly cited article is "Sexual Orientation in Women with Classical or Non-classical Congenital Adrenal Hyperplasia as a Function of Degree of Prenatal Androgen Excess" and "Sexual dysfunction in the United States: prevalence and predictors". Both of these articles provide relevant research and elaboration on sex and sexual functioning (37, 38).

Table 5: The Top 10 of Co-Citation in Psychosexual

Citation	Authors	Document	Journal
72	American Psychiatric Association (APA) (2022)	American Psychiatric Association. Diagnostic and statistical manual of mental health disorder. 2022;5:P0.DOI10.1176/Appi.Books.9780890425596	American Psychiatric Association
37	Cohen J (2013)	Cohen J. Statistical power analysis for the behavioral sciences. Academic press.2013.	New York : Academic Press
23	Mittal VA (2011)	Mittal VA, and Walker EF. Dyskinesias, tics, and psychosis: Issues for the next Diagnostic and Statistical Manuel of Mental Disorders. Psychiatry research. 2011; 189(1): 158.	PSYCHIAT RES
22	Hines M (2004)	Hines M, Brook C, and Conway GS. (2004). Androgen and psycosexual development: Core gender identity, sexual orientation, and recalled childhood gender role behavior in women and men with congenital adrenal hyperplasia (CAH). Journal of sex research. 2004; 41(1):75-81.	J SEX RES
15	Meyer-Bahlburg HFL (2008)	Meyer-Bahlburg HF, Dolezal C, Baker SW, and New MI. Sexual orientation in women with classical or non-classical congenital adrenal hyperplasia as a function of degree of prenatal androgen excess. Archives of sexual behavior. 2008; 37:85-99.	ARCH SEX BEHAV
15	Laumann EO (1999)	Laumann EO, Paik A, and Rosen RC. Sexual dysfunction in the United States: prevalence and predictors. Jama. 1999; 281(6):537-544.	JAMA-J AM MED ASSOC
11	Carter J (2018)	Carter J, Lacchetti C, Andersen BL, Barton DL, Bolte S, Damast S, and Rowland JH. Interventions to address sexual problems in people with cancer: American Society of Clinical Oncology clinical practice guideline adaptation of Cancer Care Ontario guideline. Journal of clinical oncology.2018; 36(5):492-511.	J CLIN ONCOL
11	Dessens AB (2005)	Dessens AB, Slijper FM, and Drop SL. Gender dysphoria and gender change in chromosomal females with congenital adrenal hyperplasia. Archives of sexual behavior. 2005; 34: 389-397.	ARCH SEX BEHAV
11	Pasterski V (2015)	Pasterski V, Zucker K, J Hindmarsh, PC, Hughes IA, Acerini C, Spencer D, and Hines M. Increased cross-gender identification independent of gender role behavior in girls with congenital adrenal hyperplasia: results from a standardized assessment of 4-to 11-year-old children. Archives of Sexual Behavior. 2015; 44:1363-1375.	ARCH SEX BEHAV
11	Cohen-Bendahan CCC (2005)	Cohen-Bendahan, CC, Van De Beek, C, and Berenbaum SA. Prenatal sex hormone effects on child and adult sex-typed behavior: methods and findings. Neuroscience and Biobehavioral Reviews. 2005;29(2):353-384.	NEUROSCI BIOBEHAV R

In the current study, cluster analysis was used in the analysis of co-citation literature. Its purpose is to classify data into groups with similar characteristics so that data points within each

group are more similar and data points between different groups are less similar (39). Cluster analysis is a useful data analysis method in bibliometrics that can help researchers to discover the correlations between literature, hotspots, and trends in the research field (40). Chen points out that when doing cluster analysis using CiteSpace, $Q > 0.3$ and $S > 0.5$ are the basic criteria to meet for cluster analysis (28). When doing cluster analysis in this study, the statistical method of LLR is used, with $Q = 0.895$ and $S = 0.969$, so the study meets the

criteria for cluster analysis. The cluster analysis of psychosexual shows (Figure 7) that the literature on psychosexual mainly stems from medicine (cluster0, cluster5, cluster1, cluster11, cluster12); psychology (cluster2, cluster4); biology (cluster15); sociology and the intersection of these disciplines. Psychosexual research can also be summarized in the following areas: child health and development, gender development and identity, reproductive health and functioning, and illness and health psychology.

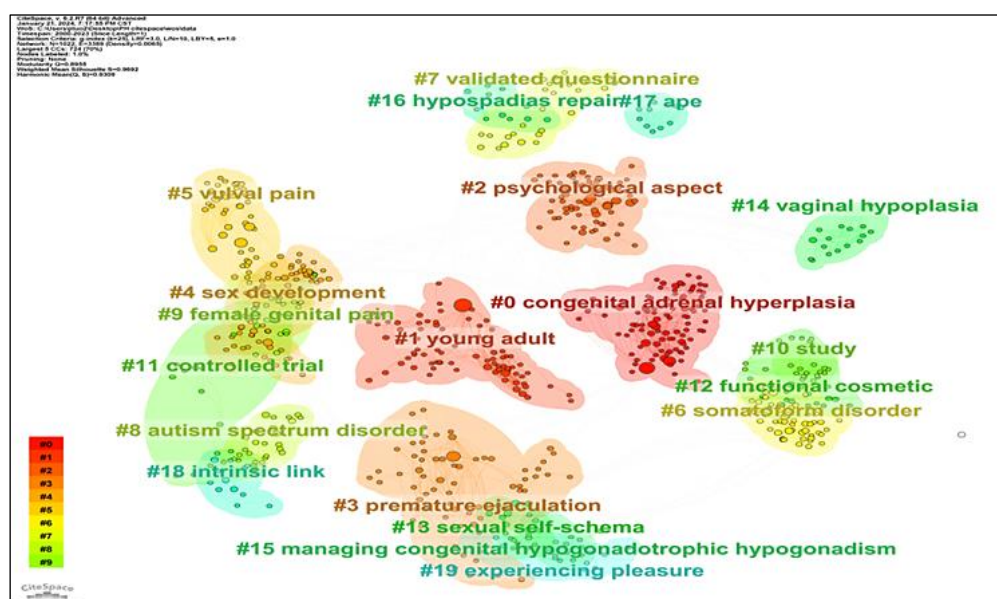


Figure 7: The Co-Cited Clustering Mapping on Psychosexual

Keywords Co-Occurrence and Cluster Analysis

As a multidimensional and interdisciplinary field, research on psychosexual studies has made remarkable progress in recent years. By analyzing the clustering of keywords, we can reveal the hotspots and trends in the psychology of sex to guide future research directions. Through our analysis, the study clustered the research keywords of psychosexual studies into 10 distinct clusters (Figure 8, Table 6). The research hotspots in the Gender Development and Identity category (Cluster 0) focus on gender development, sexual orientation, gender roles, and gender identity. Since 2007, this area has gradually become a research hotspot in psychosexual studies. Future research trends may include a deeper understanding of gender development processes, mechanisms of sexual orientation formation, and the role of gender in individual identity. Researchers may focus on the diversity of gender

identity across different cultural and social contexts, promoting the field's development through cross-cultural and cross-group perspectives. Regarding Sexual Function and Gynecologic Cancer (Cluster 1, 2), this cluster focuses on sexual function, sexual quality, and sexual experience in the treatment of gynecologic cancer. Since 2011, the relationship between sexual function and gynecologic cancers has attracted significant attention. Future research directions may include gaining insight into the specific effects of gynecologic cancer treatments on sexual function and ways to improve associated sexual experiences and quality. As women become increasingly concerned about gynecological health issues, research in this area will hopefully promote more integrated and personalized healthcare approaches. In the domain of Sexual Dysfunction and Women's Health (Cluster 2, 8), between 2008 and 2009, attention gradually shifted to female sexual dysfunction, management of sexual health

side effects from breast cancer treatment, and sexual self-patterns in young women. Future research trends may include a more comprehensive understanding of the physiological and psychological mechanisms of female sexual dysfunction, as well as proposing more effective treatments and interventions. Additionally, deeper understanding of young women's sexual self-patterns may provide new perspectives on adolescent health education. Concerning Psychosocial Development and Sexual Behavior (Cluster 3, 4), around 2010, there was a gradual shift in research focus towards psychosocial development, particularly regarding sexual behaviors and emotional abuse in the context of psychosocial developmental trajectories in childhood and adolescence. In the future, the field may focus more on the development and effective implementation of sexuality education to promote healthy sexual behaviors and relationships. The role of psychosocial factors in sexual behavior may become a key area of exploration to better understand and support young people's sexual health. The Sexual Health and Cancer Treatment (Cluster 5, 6, 7) shows that since 2013, researchers have begun to focus on the impact of cancer treatment on sexual health, as well as the psychosocial health of cancer survivors. Future

research trends may include deeper understanding of the differential impacts of various cancer treatment modalities on sexual health, and methods to provide more comprehensive psychological support for cancer survivors. Concurrently, personalized sexual health intervention programs for cancer patients and survivors may emerge. Finally, research on the Natural History and Long-Term Effects of Disease (Cluster 9, 10) demonstrates a focus on specific diseases and their impact on psychosexual well-being. More research on the long-term effects of different disease types on sexual health is likely to be conducted in the future. This type of research can help develop more comprehensive treatment plans and increase patient awareness of sexual health issues. The field of psychosexual research shows hotspots and trends of research in multiple fields and at multiple levels. Future research should be devoted to deepening the understanding of the impact of gender identity, sexual function, psychosocial development and disease on psychosexual, so as to provide more comprehensive support for the promotion of the sexual health of individuals and groups. At the same time, interdisciplinary cooperation and the development of individualized treatment will further advance the field of psychosexual research.

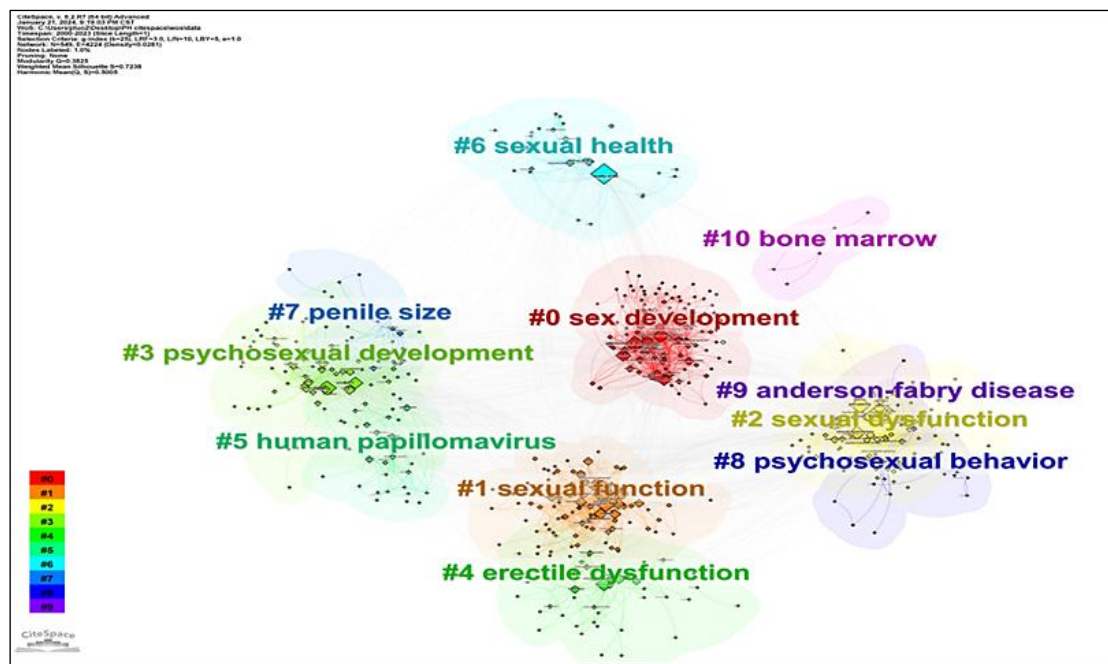


Figure 8: Keyword Co-Occurrence Clustering Mapping on Psychosexual

Table 6: Keyword Co-Occurrence Clustering

Cluster ID	Size	Silhouette	Mean(year)	Labels (LSI)
0	111	0.754	2007	sex development; sexual orientation; gender role; gender dysphoria; gender change gender identity; psychosexual development; prenatal influences; gender development; organizing factor
1	103	0.618	2011	sexual function; gynecological cancer; sexual quality; ex-plissit model; sexual experiences breast cancer; sexual dysfunction; side effect management; natural menopause; bladder lithiasis
2	92	0.652	2008	sexual dysfunction; breast cancer; side effect management; young women; sexual self-schema vulvar vestibulitis; young women; sexual self-schema; vestibulitis management; spouse
3	82	0.665	2010	psychosexual development; young women; parent; emotional abuse; psychosocial developmental trajectory sexual behavior; parent; adults; ratings; quotient aq
4	42	0.756	2009	erectile dysfunction; female partners; sexual satisfaction; marital satisfaction; testosterone treatment premature ejaculation; psychosexual therapy; faulty beliefs; therapist-patient relationship; distorted thinking
5	30	0.847	2013	human papillomavirus; cervical cancer; vulvar cancer; penile cancer; surgical procedures trial; awareness; knowledge; smear; women
6	27	0.873	2013	sexual health; patient-reported outcomes measures; bladder lithiasis; delayed puberty; sexual orientation sexual dysfunction; young adult cancer; pediatric cancer survivors; psychosexual health; patient outcome assessment
7	15	0.958	2011	penile size; psychosexual development; genital perception; dysmorphic disorders; erectile dysfunction gastrointestinal outcomes; cloaca exstrophy; gender identity issues; long-term outcomes; urinary outcomes
8	15	0.916	2009	psychosexual behavior; sexual satisfaction; sexual attitudes; alcohol use; relationship satisfaction dysmorphic disorder; female genital cosmetic surgery; psychosexual behavior; sexual attitudes; alcohol use
9	6	0.973	2001	Anderson Fabry disease; natural history; mortality; prevalence
10	5	0.986	2019	bone marrow; alkylating agent; long term; congenital adrenal hyperplasia congenital adrenal hyperplasia; long term; bone marrow; alkylating agent

Keywords Timeline and Burst Analysis

Keywords timeline can show the occurrence frequency of specific keywords in different time periods, so as to help researchers observe and

analyze the evolution process and development context of research topics over time. By analyzing the change of keywords over time, we can find the research hotspots in a specific time period, as well

as the transfer of research trends and the emergence of new research directions. Keywords burst analysis helps researchers to discover research hotspots in a certain field by identifying keywords whose citation amount or occurrence frequency increases sharply in a specific period of time. These hotspots may represent emerging research trends or current academic priorities. Because research usually has certain inertia, a hot spot will often last for a period of time, by analyzing the current emerging keywords, we can predict the future research direction and possible development trend. Therefore, through the analysis of these two aspects, the research can make certain predictions on the hot spots of psychosexual and possible research directions in the future. By further analyzing the timeline and bursts of keywords of psychosexual, we can get a glimpse of some important trends and research priorities in the field of psychosexual research (Figure 9, Figure 10). From the year 2000 until 2009, this “Vulvodynia” exhibited high burst strength. This indicates that at the beginning of the 21st century, vaginal pain became a research hotspot in the field of sexual health. This may be related to increased attention to improving the quality of women's sexual life and the treatment of sexual dysfunction. Similar to vaginal pain, dyspareunia is also an important theme in the field of sexual health, with research interest lasting from 2000 to 2009. This may reflect a broader concern for female sexual dysfunction and an exploration of improved treatment methods. From 2001 to 2007, therapy emerged as a keyword. This likely signifies that during this period, sex therapy and treatments for sexual dysfunction received significant development and attention. From 2001 until 2014, the emergence of this keyword highlights concerns about gender development and gender identity issues. This may be related to the rise of social and medical issues surrounding transgender and gender diversity. From 2002 until 2007, the emergence of gender identity may reflect an increased research interest in the LGBTQ+ community, as well as in-depth discussions of gender identity issues in psychology and sociology. Between 2005 and 2012, the emergence of sexual orientation may be related to research on the social

acceptance, legal rights, and mental health issues of non-heterosexual groups, such as homosexuals and bisexuals. From 2008 to 2011, the emergence of this keyword may be associated with attention to research and treatment methods for female sexual pain symptoms. Starting in 2008 until 2014, the emergence of this “life” may be related to research on sexual health within a broader context of life, such as the relationship between sexual health and quality of life, interpersonal relationships, and mental health. From 2010 until 2023, sexual health has consistently shown high burst strength, indicating ongoing attention to sexual health as a research field. This may be related to a global emphasis on sexual health education, prevention of sexually transmitted diseases, and sexual health policies. From 2020 until 2023, the emergence of childhood cancer may be related to concerns about psychological support and quality of life for pediatric cancer patients and their families. Overall, in the decade of 2000-2010 of research on psychosexual studies, it was found that researchers were more likely to study psychosexual from a biological and medical research perspective. In the most recent decade, the widespread interest in holistic sexual health suggests that psychosexual research is gradually moving beyond single disorders or problems and focusing more on the overall sexual health status of the individual. Sexual Health research may include concerns about sex education, sexual disease prevention, and sexual satisfaction, reflecting a holistic understanding of sexual health. This trend also echoes the development of holistic health psychology, which places psychosexual research within a broader mental health framework. Taken together, the evolution of concerns in the field of psychosexual research demonstrates a more holistic concern among researchers about gender identity pluralism, treatment of sexual disorders, and overall sexual health. This change reflects the evolution of societal attitudes that emphasize the importance of gender equality, gender diversity, and holistic sexual health. In the future, as social attitudes continue to change, the field of psychosexual research will continue to expand its scope of research to better serve the needs and concerns of society.

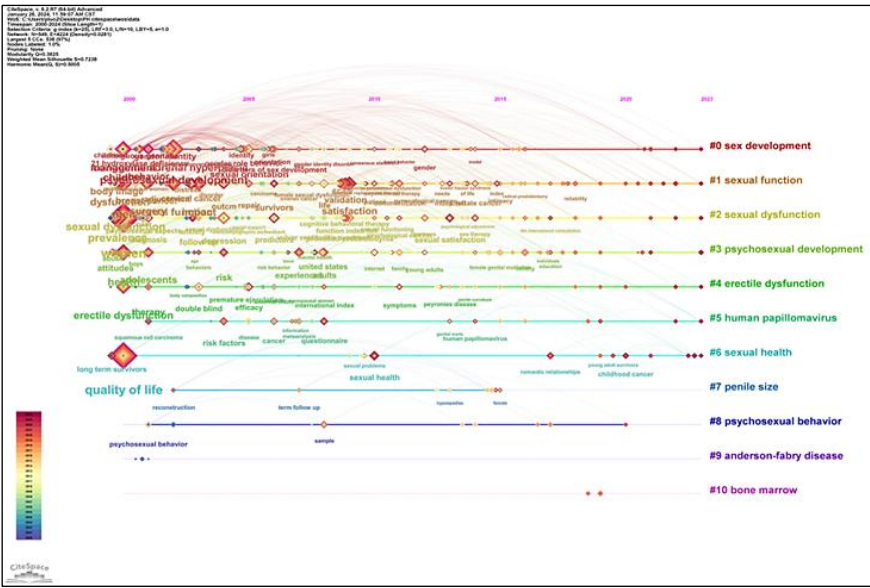


Figure 9: Timing Line of Co-Occurring Keyword Cluster in Psychosexual

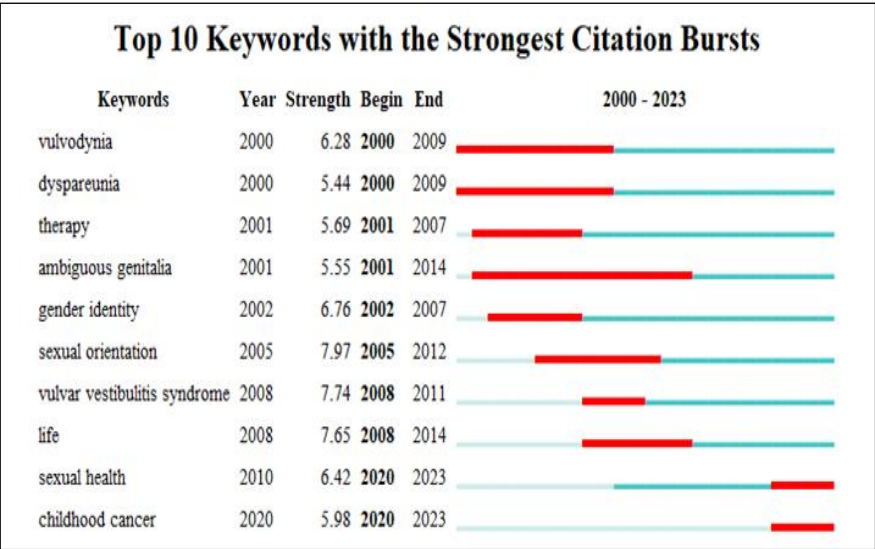


Figure 10: Top 10 Keywords with the Strongest Citation Bursts

Discussion

The study reflects the evolution trends and research hotspots of psychosexual research from multiple perspectives by analyzing the publication of psychosexual research from 2000 to 2024.

Theoretical Foundations and Historical Trajectory

Early research (2000-2009) was predominantly anchored in biomedical frameworks, as evidenced by the high citation frequency of the DSM diagnostic criteria (APA, 2022) and Laumann's (1999) epidemiological studies. This period focused heavily on sexual dysfunction classification and treatment, particularly for women's sexual health issues like vulvodynia and

dyspareunia. The subsequent decade (2010-2019) witnessed a paradigm shift toward psychosocial models, marked by increased attention to gender identity development - a transition strongly influenced by longitudinal studies of congenital adrenal hyperplasia populations (37, 41). Most recently (2020-2024), the field has embraced intersectional perspectives, with growing research on sexual health disparities in marginalized populations, as reflected in the burst detection of "LGBTQ+ health" and "childhood cancer survivor" studies. Contemporary psychosexual research has evolved into a multifaceted field organized around several interconnected domains that collectively advance our understanding of human sexuality. Central to this scholarly landscape are studies of

gender development that investigate the complex interplay between biological predispositions and sociocultural influences in shaping sexual identity. The clinical examination of sexual dysfunction has undergone significant theoretical transformation, moving beyond purely biomedical models to incorporate relational and contextual perspectives that better capture the lived experience of sexual health challenges. Complementing these approaches are lifespan investigations that trace psychosexual development across critical periods from adolescence through later adulthood, revealing both normative trajectories and vulnerability factors. Simultaneously, sociocultural research explores how evolving cultural norms and technological advancements mediate sexual expression and relationships. Together, these domains demonstrate the field's theoretical richness and its progressive shift toward integrative frameworks that acknowledge the biological, psychological, and sociocultural dimensions of sexuality. This multidimensional orientation reflects psychosexual research's growing capacity to address complex real-world sexual health issues while maintaining scientific rigor and clinical relevance. To clarify the scope of this bibliometric review, the emphasis of this study lies not on a single subdomain but rather on mapping the full breadth of psychosexual research. This includes psychological, clinical, sociocultural, and interdisciplinary aspects, as revealed through the clustering and co-citation analyses.

Future Directions and Limitations

Through the above analysis, the study of psychosexual is a growing field that focuses on the psychological basis of human sexuality and sexual health. Future research trends and directions may include examining how sexual mental health affects an individual's overall well-being, including sexual satisfaction, relationships, and quality of life; investigating the mechanisms by which sexual orientation and gender identity are formed and how they interact with mental health and social adjustment; building on the CAH research tradition exemplified (42, 43); enhancing approaches to sex education to promote healthy sexual behavior and relationships among adolescents and adults, including prevention of sexually transmitted diseases and contraceptive knowledge; exploring the causes, effects and treatments of sexual dysfunction through both psychological and

physiological lenses; as initiated in Cluster 4's therapy-focused studies; analyzing how technologies such as the Internet, social media, and sex robots influence sexual behavior and relationship dynamics; addressing mental health issues in the LGBTQ+ community with particular attention to discrimination effects, identity formation, and social support systems; extending Cluster 0's gender diversity work; researching the psychological impact of sexual assault and sexual violence while developing effective intervention and support methodologies for victims; utilizing neuroscience approaches to understand the biological basis of sexual behavior, including neural mechanisms underlying desire, arousal, and orgasm; conducting cross-cultural comparisons of sexual behaviors and attitudes to illuminate how different societies shape sexual psychology and health outcomes; evaluating how sexual health policies and legal frameworks affect behavioral patterns and healthcare accessibility; developing and accessing innovative psychosexual therapies for individuals experiencing intimacy challenges; examining how sexual behavior impacts public health through epidemiological studies and prevention strategy development; tracing psychosexual development from childhood through adulthood with emphasis on how formative experiences shape later sexual expression; and investigating the unique sexual health needs and challenges faced by aging members of the LGBTQ+ community to provide appropriate support services. These trends and directions show the breadth and depth of psychosexual research and its potential to promote sexual health and address sex-related issues. With the increasing social emphasis on sexual health, the future psychosexual research will pay more attention to interdisciplinary cooperation and diversified perspectives. Although the study has systematically and comprehensively analyzed the issues related to psychosexual research, there are some limitations in the study as follows. First, the literature search was limited to English journals in WOS, and no relevant analysis was made for papers published in other languages, which may lead to the literature not being comprehensive enough, resulting in some bias in the results. Secondly, the names of the clusters were extracted from the keywords of the references by the log-likelihood test algorithm. The authors did not refine and

analyze the content of each article, and some of the literature may not be related to the field, so when the keywords are extracted by CiteSpace, some irrelevant keywords will be analyzed together, which may cause errors in the results.

Conclusion

Overall, this study employs a bibliometric approach to comprehensively analyze the psychosexual research. It aims to reveal the evolution and trends in this field. We believe that the results of this study will provide valuable references and guidance for further development in psychosexual research.

Abbreviations

APA: American Psychiatric Association, DSM-V: Diagnostic and Statistical Manual of Mental Health Disorder (5th), LGBTQ+: Lesbian, Gay, Bisexual, Transgender, Queer or Questioning and the +, SRCD: Society for Research in Child Development, WHO: World Health Organization, WOS: Web of Science.

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Author Contributions

Ji Luo: Conceptualization, Data processing, Formal analysis, Resources, Software, Writing, Haslina Binti Muhamad: Supervision, Revision.

Conflict of Interests

The authors declared no conflicts of interest.

Ethics Approval

Not Applicable.

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