



Review and Reflection on Exercise Therapy in Psychology: A forty-years Bibliometric and Visualization Analysis

Jiyixi HUA¹, Luyao YANG¹, Jie SONG¹, Chengyang LIN¹, Xiangting YANG²,
Yaling SHANG¹, Yunan WU¹, Zheng XU^{1,3}✉

¹ School of Philosophy and Sociology, Lanzhou University, Lanzhou, China

² The 1st School of Clinical Medicine, Lanzhou University, Lanzhou, China

³ Centre for Evidence-Based Medicine Research, School of Basic Medical Sciences, Lanzhou, China

✉ xuzh@lzu.edu.cn

Abstract. The purpose of this paper is to explore the application of exercise therapy in the field of psychology. By systematically and comprehensively analyzing and synthesizing the research on exercise therapy since 1980, we aim to reveal the development of the field, the main research findings, the research hot-spots and the future development trend. Through bibliometrics and visual analyses of the relevant literature, we expect to provide a clear overview that will help researchers to better understand the importance of exercise therapy in psychology and its potential role in promoting mental health and well-being. A comprehensive search was conducted in the Web of Science Core Collection database using the keywords "exercise therapy" and "psychology." The retrieved literature was then subjected to multidimensional visualization and analysis using the visualization analysis tools VOSviewer (version 1.6.20) and CiteSpace (version 6.4.R2). The present study comprehensively examined 1305 relevant publications. The study's findings addressed the following aspects: (1) descriptive statistical analysis based on publications; (2) content analysis based on highly cited literature and keywords; and (3) author source and institution analysis based on highly cited literature. The bibliometric analysis of exercise therapy in psychology from 1980 to 2025 reveals a dynamic and rapidly evolving field, characterized by exponential growth in research output and expanding interdisciplinary collaborations. The study identifies key research hotspots, including the application of exercise therapy in cardiovascular disease, obesity, geriatric care, and mental health interventions, with a notable shift toward personalized and multicomponent approaches in recent years. Despite these advancements, gaps remain, such as the need for long-term follow-up studies, cross-cultural validations, and comparative analyses of different exercise modalities. The dominance of Western countries in publication output underscores the importance of fostering global collaborations to enhance research diversity and inclusivity. Moving forward, future research should prioritize evidence-based protocols, innovative intervention designs, and the integration of exercise therapy into mainstream psychological treatment paradigms to optimize mental health outcomes.

Keywords. Exercise Therapy, Psychology, Bibliometric, Visualization.

1 Introduction

Exercise therapy, also known as exercise intervention or physical activity intervention, is a effective therapeutic interventions that involves a series of systematic, structured physical activities, aims to prevent the onset of disease, treat pre-existing health problems, and promote the restoration and improvement of patient function (Cole et al., 2025). This therapy is not limited to treating specific conditions; it is also widely used to improve overall health, enhance fitness, and to help people stay energized and healthy in their daily lives (World Health Organization, 2018).

In the domain of psychology, exercise therapy has gained significant traction as a complementary treatment for a range of mental health conditions. These include, but are not limited to, depression, anxiety, and post-traumatic stress disorder (PTSD) (Schuch et al., 2016; van de Kamp et al., 2019). The mechanism of action cover a wide range of physiological and psychological dimensions. At the physiological level, neuroplasticity, that exercise by increasing dopamine, D1R, and D2R leads to the expression of BDNF and activation of Trk B, which triggers antidepressant behavior (Alizadeh Pahlavani, 2024). At the psychological level, exercise also affect mental health by increasing participation in and reward sensitization to activities that are meaningful or beneficial to the individual increasing self-efficacy (Smith & Merwin, 2021). Exercise therapy also has a wide range of suitability, with studies showing it has therapeutic effects on depression in all age groups (mostly 18-65 years old), and the benefits of exercise therapy are comparable to traditional treatments for depression (Xie et al., 2021).

Despite the exponential growth of exercise therapy research in the field of psychology, bibliometrics, which is widely used as a tool to analyze the structure of knowledge and to examine the evolution of the discipline and to assess scientific outputs and predict future research trends (Chen et al., 2024), was found to be relatively understudied in terms of hotspots and trends in exercise therapy research.

This study will utilize bibliometric methods to map the global collaborative network of exercise therapy in psychology since 1980. This paper aims to systematically and comprehensively summarize the developmental trends and current research status of exercise therapy by identifying the evolutionary paths of research hotspots. It also seeks to provide an evidence-based foundation for interdisciplinary collaborations, clinical translations, and policy formulation. To this end, the paper presents the trend of article issuance, the core authors, the hot topics, and the evolution of exercise therapy research.

2 Materials and Methods

2.1 Data Source and Retrieval Strategy

This study systematically searched Web of Science. When compared to other databases such as Scopus, Medline, and PubMed, Web of Science provides the most comprehensive and reliable bibliometric analysis (Falagas et al., 2008.). The search period was from January 1st, 1980 to April 30th, 2025. First, we used the search strategy "Topic = ("exercise therap*" or "physical activit* intervention)" and "All Fields =

("psycholog*" or "mental health")" in the Web of Science Core Collection, which is widely recognized as ideal for scientometric analyses due to its extensive literature and rich publication data (van Leeuwen, 2006).

To ensure proper interpretation of the results, the publication language was restricted to English. A complete record and cited references were then extracted from relevant publications, saved in plain text format, for further research (Jiang et al., 2023).

2.2 Data Extraction

Full records for the retrieved papers, including titles, authors, abstracts, and cited references, were exported in the form of plain text and were used as the dataset for this study (Wu et al., 2021). Then, the txt. files were imported to WPS Office (Version 12.1.0) for further processing. Analysis indicators included publication number and year, the annual amount of publications, sum of times, countries/regions, institutions, journals, authors, citations, keywords, H-index, and the 2025 impact factor (IF) and journal citation reports (JCR) category. Finally, data were imported into the Online Analysis Platform of bibliometric (<http://bibliometric.com>), NoteExpress (Version 4.2.0), VOS viewer (Version 1.6.20), and CiteSpace (Version 6.4.R1) for bibliometric analysis.

2.3 Software for Bibliometric Analysis

NoteExpress is a professional literature retrieval and management system developed by the Beijing Aegean software company (Li et al., 2022). In this study, it was used to manage the bibliographic records exported from the Web of Science Core Collection.

VOS viewer is a software tool used in constructing bibliometric networks of scientific literature (van Eck & Waltman, 2010). In this study, this software was used for analyzing and visualizing co-authorship, citation, source, and co-occurrence networks of countries, institutions, and keywords. In the network maps generated by VOS viewer, different nodes represented different elements, while the size of the nodes in the map was proportional to the number of publications or frequency. The color of the nodes and lines indicated different appearance year or clusters. The line between the nodes represented the associations, and the strength of the links was assessed by the indicator of total link strength (TLS)(Wu et al., 2021).

CiteSpace is a visual analysis software that focuses on analyzing the trends and dynamic changes in scientific research literature as well as identifies key points in a given field (Synnvestvedt et al., 2005). In this study, it was used to detect keyword bursts in publication. The parameters of CiteSpace used were set as follows: time slicing (1982 - 2025), years per slice (1), term source (keyword), node type (choose one parameter at a time such as author, co-author, cited journal, or reference), selection criteria (top 10), pruning (minimum spanning tree, pruning sliced networks), and visualization (cluster view-static).

3 Result

3.1 Overview of Publication Status

In total, 1305 Web of Science Core Collection publications from 1980 to 2025 were retrieved. These articles were published in 563 journals and written by 6524 authors from 2174 organizations in 77 countries.

3.2 Annual Publication Statistics

Figure 1 displays the annual and cumulative publication counts related to exercise therapy in the field of psychology. After publishing one article each in 1982 and 1983, there was an eight-year gap with no relevant literature until 1992, when publications on the topic resumed. From just one article in 1992, the cumulative number steadily increased to nine by 2005. Subsequently, following the release of the European guidelines for management of chronic nonspecific low back pain (Airaksinen et al., 2006), the publication count surged rapidly over the next 19 years, reaching 138 articles by 2024. An exponential growth function was then used to evaluate the relationship between cumulative publications and publication year, which matched the trend in the cumulative number of publications ($R^2 = 0.981$). This strong correlation suggests that exercise therapy with psychology field has experienced significant growth and development.

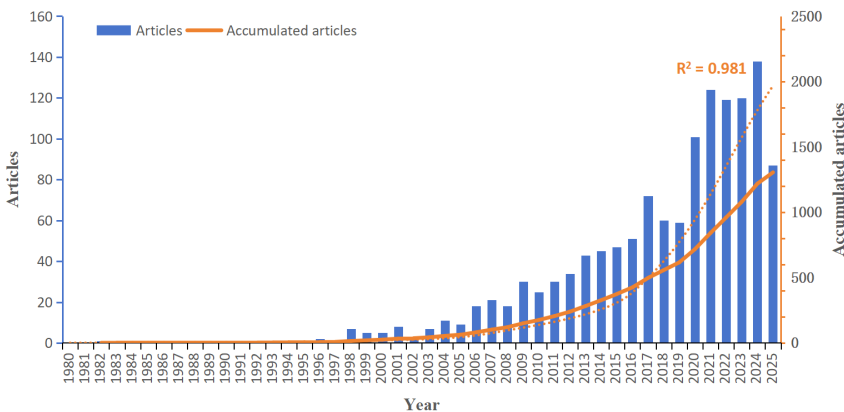


Figure 1: Number of Publications per Year and the Cumulative Number

3.3 Analysis of National Publication Counts

National publication counts were analyzed to investigate the countries contributing the most in this field. From 1980 to 2025, according to the corresponding authors' countries are shown researchers from 77 countries published work in this field, covering almost all parts of the world. However, the distribution of these publications is uneven, as shown in Table 1 and Figure 2. The United States ranks first with 305 publications, followed by the UK (215), Australia (159), Germany (140), China (129), and Canada (119). The remaining countries have fewer than 100 publications.

Similar patterns are observed in the number of citations. The United States and the United Kingdom lead in terms of academic influence, with the U.S. receiving more than twice the number of citations compared to all other countries excluding the UK. In addition, the United States showed the highest ratio of multiple-country publications among the total publications, indicating a high inter-country collaboration rate. In Figure 3, Although non-Western countries like China, Japan, India and South Africa have recently played vital roles in producing knowledge on exercise therapy, Western countries still dominate the overall landscape.

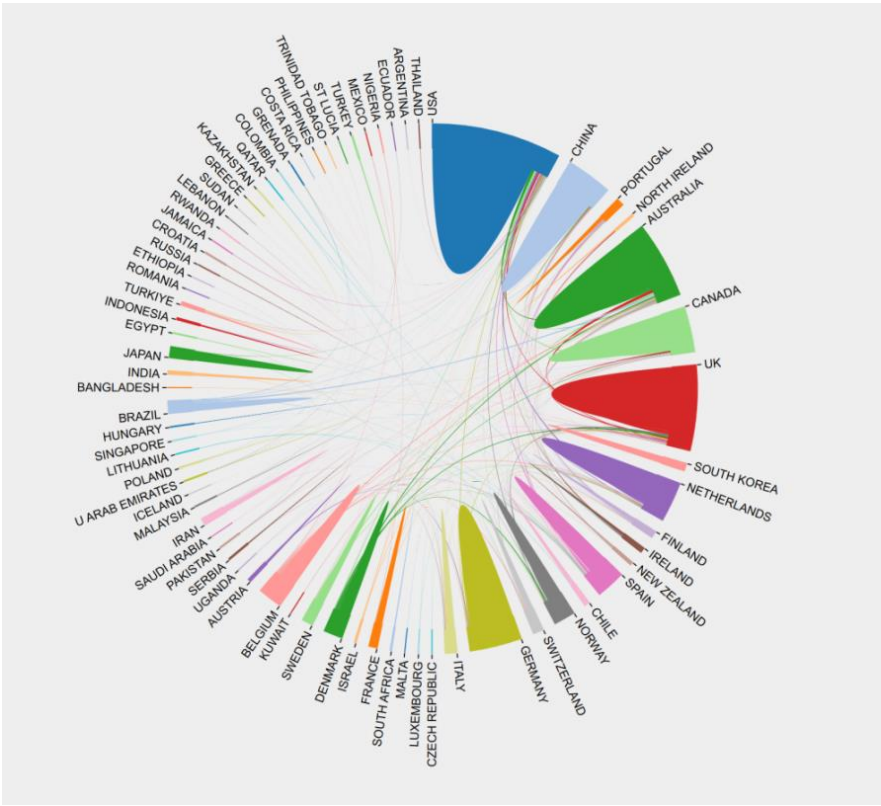
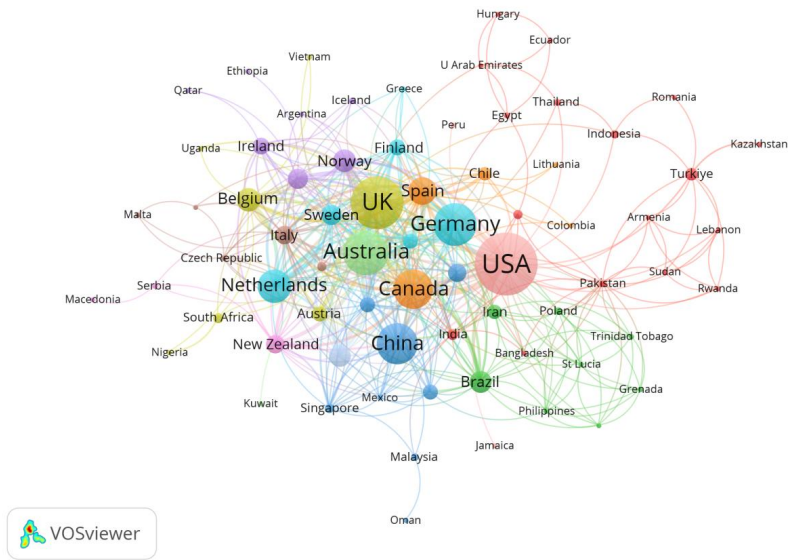


Figure 2: The Cooperation Relationships of Countries or Regions

Table 1: The Top 10 Most Productive Countries

Country	Number of articles	Freq
USA	305	23.35%
UK	215	16.46%
Australia	159	12.17%
Germany	140	10.72%
China	129	9.88%
Canada	119	9.11%
Netherlands	85	6.51%
Spain	58	4.44%
Belgium	44	3.37%
Norway	39	2.99%



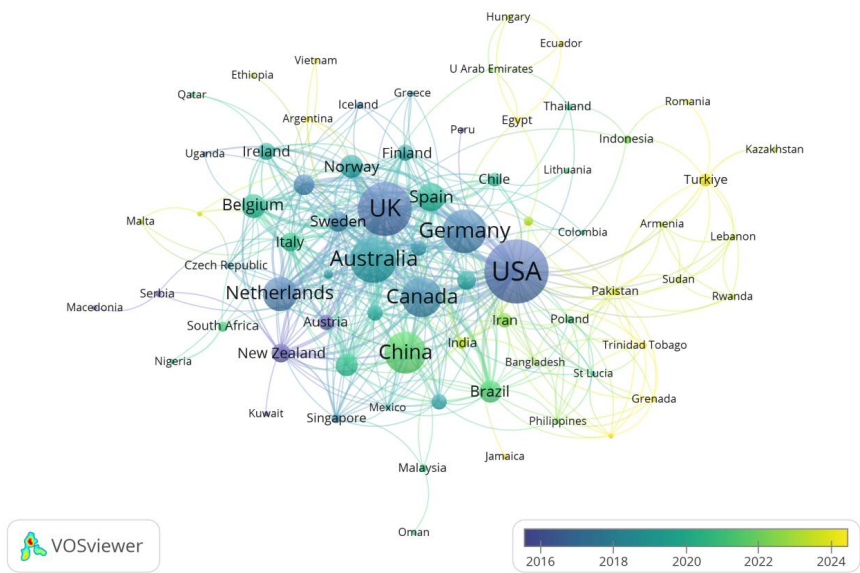


Figure 3: Visualization of Time-Overlapping Networks in National Co-authorship Analysis

3.4 Analysis of Institution Publications

To explore institutions’ contributions to exercise therapy in psychology fields, the number of publications from various institutions was analyzed. Exercise therapy research was conducted at approximately 2174 institutions worldwide. As shown in Figure 4, among the top 22 institutions with the most publications in the field of exercise therapy, six research institutions are from the United States, four from the United Kingdom, four from Australia, three from the Netherlands, three from Canada, one from Denmark, and one from Belgium. With 32 articles published, the University of Queensland ranked first.

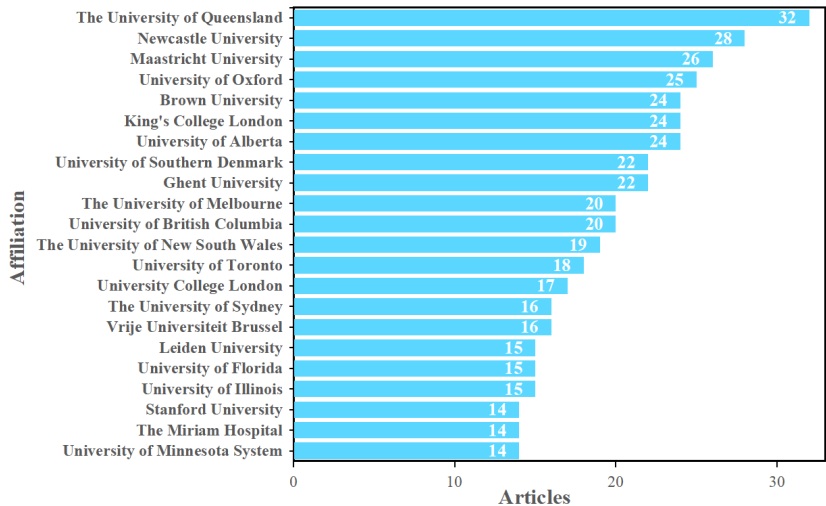
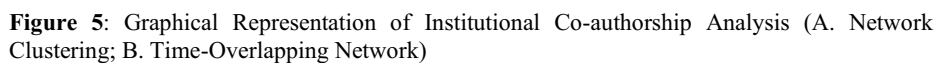


Figure 4: The Top 22 Institutions with the Most Publications in the Field of Exercise Therapy

To further investigate collaboration between institutions, we performed a co-authorship analysis of all publications. Figure 5 shows that 85 institutions published at least 5 papers. These 85 institutions formed seven clusters, with the red cluster being the largest, consisting of 23 institutions, mainly from Western country. These research institutions, led by Brown University, contributed significantly to exercise therapy’s early development. In contrast, other research institutions became more involved in exercise therapy research after 2020.



3.5 Analysis of Publication Quantity and Journal Impact

The study included 1305 articles published in 563 journals. Table 2 lists the top 10 journals ranked by publication quantity and their latest 2025 impact factors (IF). Four top 10 journals were in the first quartile (Q1) of the Journal Citation Reports (JCR). There are four publishers from the USA, three from the UK, two from Switzerland, and one publisher from Netherlands.

Table 2: Top 10 Journals in the Field of Exercise Therapy

Rank	Source	Article	Country	Impact Factor	JCR-c
1	Journal of Sport and Exercise Psychology	37	USA	2.6	Q2
2	Cochrane Database of Systematic Reviews	34	UK	9.4	Q1
3	Journal of Health Psychology	29	USA	2.2	Q2
4	Mental Health and Physical Activity	29	Netherlands	2.6	Q2
5	BMC Public Health	25	UK	3.6	Q1
6	Frontiers in Psychology	25	Switzerland	2.9	Q2
7	Psychology & Health	24	USA	1.9	Q2
8	Health Psychology	22	USA	3.2	Q1
9	International Journal of Environmental Research and Public Health	22	Switzerland		
10	BMJ Open	17	UK	2.4	Q1

Among them, International Journal of Environmental Research and Public Health does not have an impact factor or JCR classification. Since 2023, due to declining publication quality, a large volume of publications (over 10,000 in 2021 and 2022), and consistently high self-citation rates, it has been removed from the SCI journal directory by Clarivate Analytics for non-compliance with submission guidelines.

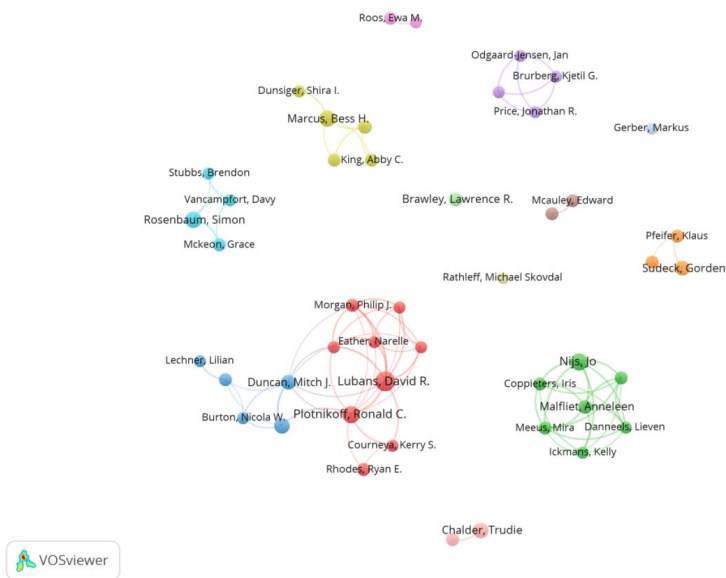
3.6 Author Impact Analysis

A total of 6524 authors participated in research on exercise therapy. Table 3 shows the top 10 most prolific authors in exercise therapy research over the study period. Lubans, David R. is the most productive author, with 14 articles published and a 72 H-index. Following closely behind were Nijs, Jo (11 articles, H-index = 69) and Plotnikoff, Ronald C. (11 articles, H-index = 62).

Table 3: Top 10 Authors in the Field of Exercise Therapy

Rank	Author	Article	H-index
1	Lubans, David R.	14	72
2	Nijs, Jo	11	69
3	Plotnikoff, Ronald C.	11	62
4	Marcus, Bess H.	10	50
5	Rosenbaum, Simon	10	60
6	Vandelanotte, Corneel	9	50
7	Chalder, Trudie	9	66
8	Sudeck, Gorden	8	21
9	Duncan, Mitch J.	8	44
10	Malfliet, Anneleen	8	28

Researchers' collaborative relationships are illustrated in Figure 6. One hundred seventy-five authors with five or more articles were grouped into 13 clusters. The clusters were analyzed to understand the collaboration patterns and networks within the field. The largest cluster is marked in red, consisting of 9 closely collaborating authors. This cluster brings together several highly productive scholars, such as Lubans, David R. and Plotnikoff, Ronald C., demonstrating the strong academic community within this group. The second largest cluster is displayed in green, comprising 7 closely cooperating authors, including well-known figures like Nijs, Jo. The third largest cluster is presented in blue, encompassing 5 authors led by Duncan, Mitch J., with this cluster maintaining close collaborative relationships with authors from the red cluster. The remaining clusters varied in size, with the smallest cluster consisting of only 1 authors. Collaborative network analysis reveals that authors from different institutions



and countries have not yet established cooperative relationships, highlighting the urgency of promoting collaboration between nations and institutions within the field of exercise therapy research.

Figure 6: Graphical Representation of Researcher Co-authorship Analysis

3.7 Research Hotspot Analysis

3.7.1 Most Cited Publications

It is possible to evaluate the most cited articles based on the frequency of citations in that field. In Table 4, we list the top 10 most cited publications, with all articles cited over 400 times. There was one article published in 2006 that has received the most citations: ‘Chapter 4 - European guidelines for the management of chronic nonspecific low back pain’ (Airaksinen et al., 2006). This study points out that in the treatment of chronic nonspecific low back pain, exercise therapy combined with cognitive - behavioral principles can effectively improve patients' functional status and reduce work absenteeism, thereby highlighting the critical role of psychological factors in the rehabilitation process. Cochrane Database of systematic reviews also published the second most cited publication (Cooney et al., 2013). This study demonstrates that exercise therapy has a significant effect in effectively alleviating depressive symptoms and can improve patients' mental health and quality of life in the long term. Compared to pharmacological treatment, exercise therapy has no side effects, exhibits higher patient compliance, making it a safe and feasible intervention. Furthermore, exercise can be combined with other treatment modalities, potentially further constituting a comprehensive management strategy for depression. These two studies provide strong evidence for the clinical application of exercise therapy.

Table 4: The Top 10 Cited Articles

Rank	Title	Year, Journal	First author	Total citations
1	Chapter 4 - European guidelines for the management of chronic nonspecific low back pain	2006, European Spine Journal	Airaksinen, Olavi	1755
2	Exercise for depression	2013, Cochrane Database of systematic reviews	Cooney, Gary	806
3	Physical Activity for Cognitive and Mental Health in Youth: A Systematic Review of Mechanisms	2016, Pediatrics	Lubans, David R.	796
4	Exercise treatment for major depression: Maintenance of therapeutic benefit at 10 months	2000, Psychosomatic Medicine	Babiyak, Michael A.	642
5	International Exercise Recommendations in Older Adults (ICFSR): Expert Consensus Guidelines	2021, Journal of Nutrition Health & Aging	Izquierdo, Mikel	613
6	Physical activity and quality of life in older adults	2001, Journals of Gerontology Series A-Biological Sciences and Medical Science	Rejeski, W. Jack	584
7	Management of Depression in Older Adults A Review	2017, Journal of the American Medical Association (JAMA)	Kok, Rob M.	551
8	Controlled physical activity trials in cancer survivors: A systematic review and meta-analysis	2005, Cancer Epidemiology Biomarkers & Prevention	Schmitz, Kathryn H.	483
9	What are the most effective intervention techniques for changing physical activity self-efficacy and physical activity behaviour-and are they the same?	2011, Health Education Research	Williams, Stefanie L.	467
10	The WHO Health Promoting School framework for improving the health and well-being of students and their academic achievement	2014, Cochrane Database of Systematic Reviews	Langford, Rebecca	455

3.7.2 Frequency and Clustering Analysis of Keywords

Among 4920 keywords, 106 met the threshold of 20 occurrences, and were analyzed. Figure 7 shows the network visualization of these keywords. In order to reflect the critical themes in exercise therapy research, the 106 keywords were grouped into four clusters. Closely related keywords were clustered together. Group 1, represented in red, focused on the management and treatment (cognitive behavioral therapy, exercise therapy, physical therapy) and rehabilitation of chronic pain (such as fibromyalgia, osteoarthritis, low back pain) and chronic fatigue syndrome, with emphasis on research involving randomized controlled trials, efficacy evaluation, guideline adherence, and patient outcomes. Group 2, represented in green, focused on the association between mental health issues (such as anxiety and depression) in adults (especially the elderly) and physical activity interventions (such as cardiac rehabilitation), this study examines the impact of risk factors, sedentary behavior, self-efficacy, and quality of life. Group 3, represented in blue, focused on the prevention and intervention of overweight/obesity in children and adolescents, studying the effects of physical activity, nutrition, motivation (e.g., self-determination theory), and behavior change on health, cognition, and sports performance, involving systematic reviews and meta-analyses. The yellow Group 4 focused on cancer patients (such as breast cancer) and survivors, the study investigates the effects of physical activities like aerobic exercise and muscle strength training on fatigue, quality of life, and survival outcomes, based on randomized controlled trial evidence.

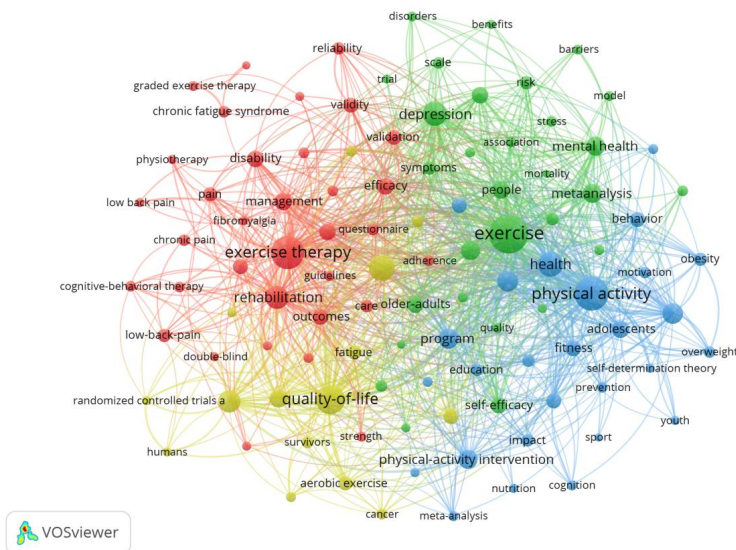


Figure 7: Keyword Co-occurrence Network

Figure 8 shows the visualization of the time-overlapping of keywords. Early-appearing keywords are displayed in blue, while recent keywords are displayed in red. Early research primarily focused on rehabilitation care for chronic pain and motor dysfunction. Recent studies, however, have placed greater emphasis on improving quality of life through physical activity interventions as well as symptom prevention and alleviation of mental health conditions.

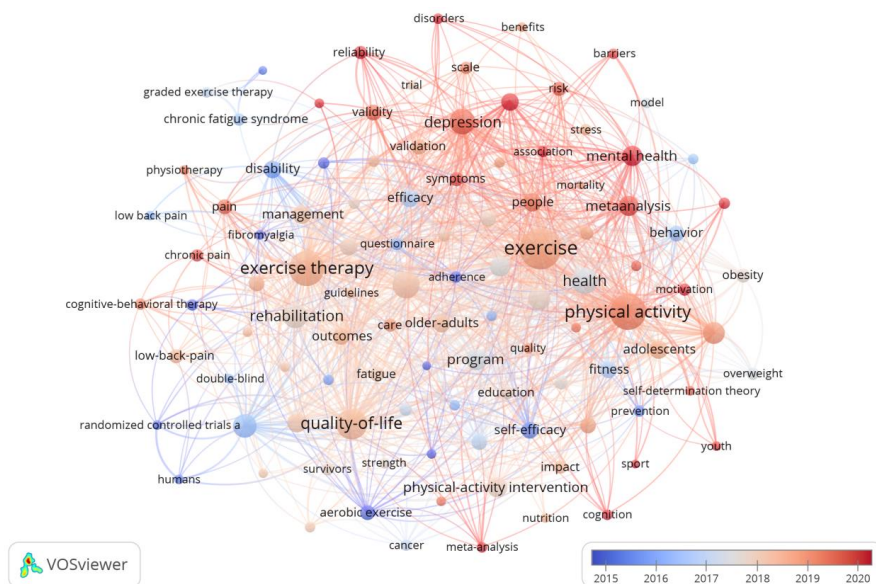


Figure 8: Time-overlapping Co-occurrence Analysis Network of Keywords

Figure 9 displays the top 20 keywords sorted by frequency, with ‘Exercise’ being the most frequently used keyword, appearing 386 times, followed by ‘Physical Activity’ (N = 286). ‘Exercise therapy’ appeared 55 times, ranking third. High-frequency terms such as ‘Exercise’, ‘Physical Activity’, ‘Exercise Therapy’, and ‘Quality-Of-Life’ indicate that research on exercise primarily focuses on health interventions, quality-of-life improvement, and clinical treatment domains. Medium-frequency terms like ‘Rehabilitation’ and ‘Mental Health’ reflect the application of exercise in rehabilitation and psychological fields, while low-frequency terms such as ‘Management’ suggest limited related research, potentially indicating areas for further exploration. Overall, studies on exercise therapy span multiple age groups and predominantly employ empirical methods such as randomized controlled trials.

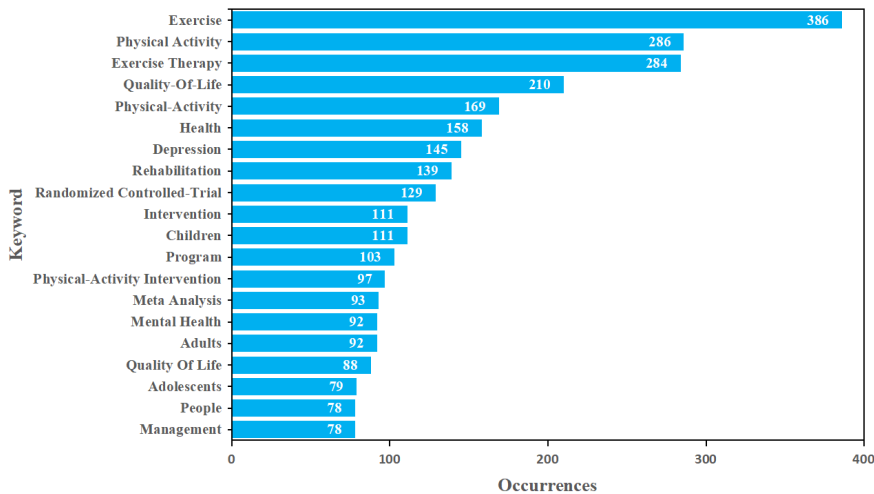


Figure 9: A List of the 20 Most Frequently Used Keywords

3.7.3 Analysis of Keywords Bursts

In Figure 10, we present the top 10 keywords with the strongest citation bursts lasting at least one year. The keyword 'aerobic exercise' (1997) is the earliest emergent term. The keywords 'cardiac rehabilitation' (1999 - 2014) received the most sustained attention. However, keywords such as 'mental health'(2021 - 2025) have recently been used, indicating that future research will focus on.

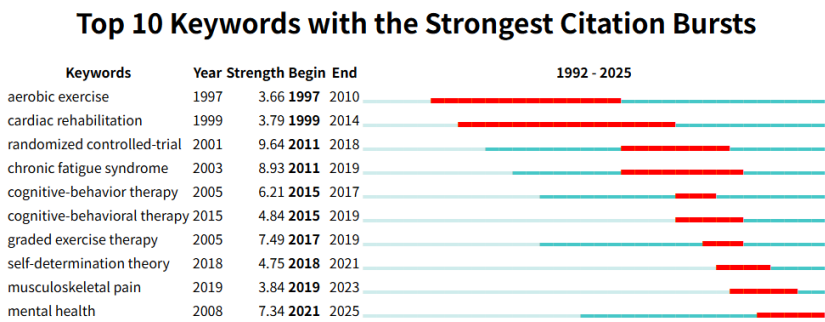


Figure 10: The 20 Keywords with the Strongest Citation Bursts

4 Discussion

Bibliometric methods were used to analyze the growth pattern of exercise therapy-related research in psychology field from 1980 to 2025. There are three stages of exercise therapy related research growth based on whether the number of publications exceeds 10 per year and whether the number of publications exceeds 100 per year. In 1982, the first significant article on exercise therapy within the field of psychology was published, signifying the commencement of scientific advancement in this domain (Blumenthal et al., 1982). However, development in this area stalled from that point until 1992. Before 2005, with the exception of 2004, when 11 publications emerged, the number of publications in other years did not surpass 10, indicating a sluggish growth pattern. Since 2009, research pertaining to exercise therapy has undergone explosive growth, with the yearly publication count surpassing 20. By 2020, the annual publication volume had surged to 101, clearly demonstrating that research on exercise therapy has entered a phase of rapid development. The potential reason may be that with the popularity of health awareness and the emphasis on preventive healthcare, exercise therapy has gained recognition as an effective means to address various psychological and physical conditions (Mahindru et al., 2023). Therefore, research institutions have continued to increase their support for exercise therapy-related research, and research funding has continued to increase, promoting the rapid development of this field.

Among the top 20 institutions, 6 are located in the United States, 4 in the United Kingdom, and 4 in Australia, a distribution that roughly aligns with the number of publications by country. Although Germany and China rank fourth and fifth respectively in terms of publication volume, no institutions from these countries appear among the top publishers, indicating a more dispersed distribution of publications within these nations. In contrast, one institution from the Netherlands ranks third with 26 publications. These studies primarily rely on international collaboration, highlighting the importance of seeking extensive inter-institutional cooperation to enhance research competitiveness, particularly under economic or resource constraints.

Peer-reviewed journals are crucial for academic publishing. Core journals typically publish essential research within their respective fields, serving as indispensable resources in the academic community. Researchers can identify potential target journals for manuscript submission by analyzing the publication volume in the field of exercise therapy, thereby more effectively disseminating their research findings. *Journal of Sport and Exercise Psychology* ranked first with 37 published articles. However, its impact factor (IF) is only 2.6, belonging to the JCR Q2 journal category. The journal with the highest impact factor is *Cochrane Database of Systematic Reviews* (IF 9.4), followed by *BMC Public Health* (IF 3.6). Impact factor and JCR are commonly used indicators to evaluate the influence of journals. JCR divides all journals into four quartiles (Q1-Q4) based on their IF. In the top 10 journals by paper count, Q1 journals account for 40%. Moreover, despite Australia's significant contributions to the field of exercise therapy research, it has yet to publish a specialized journal in this area. Therefore, establishing and developing an internationally influential journal in Australia is particularly crucial.

This study aims to address the research hotspots that have been extensively studied by scholars during a specific period. The number of citations can serve as an

indicator for measuring the influence of academic publications(Xu & Sun, 2020). Research hotspots can be determined by calculating citation counts and identifying highly cited literature. In this study, the 10 most frequently cited publications were published between 2000 and 2021 and mainly focused on exercise therapy's clinical application.

Early studies primarily employed randomized controlled trials (RCTs) and systematic reviews as the main methodologies, focusing on efficacy validation in specific populations. The 2000 study by (Babyak et al., 2000) was the first to demonstrate the long-term efficacy of aerobic exercise for major depressive disorder (MDD) through an RCT, revealing that the exercise group had significantly lower relapse rates than the medication group, providing critical evidence for exercise as a psychological intervention. In 2005, Schmitz's systematic review of cancer survivors expanded the application of exercise therapy to the field of oncology rehabilitation, demonstrating its moderate effects on cardiopulmonary function and symptom relief. Although data on adverse events were lacking, this study laid an evidence-based foundation for clinical recommendations. The study by Airaksinen (2006) further incorporated exercise therapy into first-line treatment plans, highlighting its comprehensive value in conditions such as chronic pain and pointing out the need for future research to address intervention heterogeneity.

Subsequent research shifted toward exploring the mechanisms of exercise and behavioral intervention techniques. The 2011 meta-analysis by Williams and French, revealed that techniques such as "action planning" and "effort reinforcement" could enhance self-efficacy, providing methodological insights for improving exercise adherence. In 2016, Lubans's theoretical framework categorized the mechanisms by which exercise improves mental health into neurobiological, psychosocial, and behavioral dimensions, with the most robust evidence supporting improvements in physical self-perception, while neurobiological mechanisms required further investigation due to high research heterogeneity.

Recent studies have placed greater emphasis on individualized precision and multidisciplinary integration. The 2017 review by Kok and Reynolds on geriatric depression underscored the safety of exercise therapy in polypharmacy scenarios, combining STOPP/START criteria to reduce drug interactions, reflecting the need for refined clinical practice. In 2021, Izquierdo proposed that exercise prescriptions should be personalized based on expected outcomes, with multicomponent training showing significant improvements in physical function and cognitive abilities among older adults.

Despite the rapid development of exercise therapy in recent years, there are still some limitations, such as the lack of long-term follow-up data (Langford et al., 2014), the absence of direct comparative studies on the specific differences in psychological intervention effects among different types of exercise, and the relatively limited research on cross-cultural applicability.

The analysis of keyword bursts further highlights the emerging trends and areas of focus in exercise therapy research. The sustained attention on 'cardiac rehabilitation' and the recent emergence of 'mental health' as a key area of interest suggest that researchers are responding to the changing healthcare landscape and the increasing demand for psychological well-being interventions. As such, future research in this field is likely to continue exploring innovative ways to integrate exercise therapy into

psychological treatment protocols, aiming to enhance overall health outcomes and quality of life.

This study has certain limitations. Firstly, it only includes articles written in English and indexed in the Web of Science Core Collection database. Given that the WoSCC encompasses the vast majority of high-quality studies, this does not impact the overall trend of the results. Second, recently published high-quality studies may not have received the attention they deserved due to citation delays and need to be updated in subsequent studies. Nevertheless, this study will significantly assist relevant researchers in understanding the development, hotspots, trends, and frontiers of exercise therapy in psychology field and identifying areas that still require further research.

5 Conclusions

The bibliometric analysis of exercise therapy in psychology from 1980 to 2025 reveals a dynamic and rapidly evolving field, characterized by exponential growth in research output and expanding interdisciplinary collaborations. The study identifies key research hotspots, including the application of exercise therapy in cardiovascular disease, obesity, geriatric care, and mental health interventions, with a notable shift toward personalized and multicomponent approaches in recent years. Despite these advancements, gaps remain, such as the need for long-term follow-up studies, cross-cultural validations, and comparative analyses of different exercise modalities. The dominance of Western countries in publication output underscores the importance of fostering global collaborations to enhance research diversity and inclusivity. Moving forward, future research should prioritize evidence-based protocols, innovative intervention designs, and the integration of exercise therapy into mainstream psychological treatment paradigms to optimize mental health outcomes.

6 Funding

This research was funded by Soft Science Special Project of Gansu Basic Research Plan under Grant No. 23JRZA375.

References

- Airaksinen, O., Brox, J., Cedraschi, C., Hildebrandt, J., Klaber-Moffett, J., Kovacs, F., Mannion, A., Reis, S., Staal, J., Ursin, H., Zanoli, G., & COST B13 Working Grp Guidelines Ch. (2006). Chapter 4—European guidelines for the management of chronic nonspecific low back pain. *European Spine Journal*, 15, S192–S300. <https://doi.org/10.1007/s00586-006-1072-1>
- Alizadeh Pahlavani, H. (2024). Possible role of exercise therapy on depression: Effector neurotransmitters as key players. *Behavioural Brain Research*, 459, 114791. <https://doi.org/10.1016/j.bbr.2023.114791>
- Babyak, M., Blumenthal, J. A., Herman, S., Khatry, P., Doraiswamy, M., Moore, K., Craighead, W. E., Baldewicz, T. T., & Krishnan, K. R. (2000). Exercise treatment for major

- depression: Maintenance of therapeutic benefit at 10 months. *Psychosomatic Medicine*, 62(5), 633–638. <https://doi.org/10.1097/00006842-200009000-00006>
- Blumenthal, J. A., Williams, S. R., Wallace, A. G., Williams, R. B. J., & Needles, T. L. (1982). Physiological and psychological variables predict compliance to prescribed exercise therapy in patients recovering from myocardial infarction. *Biopsychosocial Science and Medicine*, 44(6), 519.
- Mahindru A, Patil P, Agrawal V. Role of Physical Activity on Mental Health and Well-Being: A Review. *Cureus*. 2023 Jan 7;15(1):e33475. doi: 10.7759/cureus.33475
- Chen, G., Chen, W., Qi, S., & Shek, D. T. L. (2024). Improving child and adolescent mental health: A bibliometric analysis of related intervention studies. *International Journal of Environmental Research and Public Health*, 21(12). <https://doi.org/10.3390/ijerph21121576>
- Cole, M., Owens, J., & Holland, C. J. (2025). Sports and exercise therapy for marginalised communities: Graduate sports therapists in east london foundation trust mental health and the british transplant games. *Br J Sports Med*.
- Cooney, G. M., Dwan, K., Greig, C. A., Lawlor, D. A., Rimer, J., Waugh, F. R., McMurdo, M., & Mead, G. E. (2013). Exercise for depression. *The Cochrane Database of Systematic Reviews*, 2013(9), CD004366. <https://doi.org/10.1002/14651858.CD004366.pub6>
- Falagas, M. E., Pitsouni, E. I., Malietzis, G. A., & Pappas, G. (2008). *Comparison of PubMed, scopus, web of science, and google scholar: Strengths and weaknesses*. <https://doi.org/10.1096/fj.07-9492LSF>
- Izquierdo, M., Merchant, R. A., Morley, J. E., Anker, S. D., Aprahamian, I., Arai, H., Aubertin-Leheudre, M., Bernabei, R., Cadore, E. L., Cesari, M., Chen, L.-K., De Souto Barreto, P., Duque, G., Ferrucci, L., Fielding, R. A., García-Hermoso, A., Gutiérrez-Robledo, L. M., Harridge, S. D. R., Kirk, B., ... Singh, M. F. (2021). International exercise recommendations in older adults (ICFSR): Expert consensus guidelines. *The Journal of Nutrition, Health and Aging*, 25(7), 824–853. <https://doi.org/10.1007/s12603-021-1665-8>
- Jiang, S., Liu, Y., Zheng, H., Zhang, L., Zhao, H., Sang, X., Xu, Y., & Lu, X. (2023). Evolutionary patterns and research frontiers in neoadjuvant immunotherapy: A bibliometric analysis. *International Journal of Surgery (London, England)*, 109(9), 2774–2783. <https://doi.org/10.1097/JS9.0000000000000492>
- Kok, R. M., & Reynolds, C. F. (2017). Management of depression in older adults: A review. *JAMA*, 317(20), 2114–2122. <https://doi.org/10.1001/jama.2017.5706>
- Langford, R., Bonell, C. P., Jones, H. E., Poulou, T., Murphy, S. M., Waters, E., Komro, K. A., Gibbs, L. F., Magnus, D., & Campbell, R. (2014). The WHO health promoting school framework for improving the health and well-being of students and their academic achievement. *Cochrane Database of Systematic Reviews*, 2014(4). <https://doi.org/10.1002/14651858.CD008958.pub2>
- Li, J., Sun, X., Dai, X., Zhang, J., & Liu, B. (2022). Knowledge Map Analysis of Industry–University Research Cooperation Policy Research Based on CNKI and WOS Visualization in China. *Sustainability*, 14(13). <https://doi.org/10.3390/su14137862>
- Lubans, D., Richards, J., Hillman, C., Faulkner, G., Beauchamp, M., Nilsson, M., Kelly, P., Smith, J., Raine, L., & Biddle, S. (2016). Physical activity for cognitive and mental health in youth: A systematic review of mechanisms. *Pediatrics*, 138(3), e20161642. <https://doi.org/10.1542/peds.2016-1642>
- Schmitz, K. H., Holtzman, J., Courneya, K. S., Masse, L. C., Duval, S., & Kane, R. (2005). Controlled physical activity trials in cancer survivors: A systematic review and meta-analysis. *Cancer Epidemiology, Biomarkers and Prevention*, 14(7), 1588–1595. <https://doi.org/10.1158/1055-9965.EPI-04-0703>
- Schuch, F. B., Vancampfort, D., Richards, J., Rosenbaum, S., Ward, P. B., & Stubbs, B. (2016). Exercise as a treatment for depression: A meta-analysis adjusting for publication bias.

- Journal of Psychiatric Research*, 77, 42–51. <https://doi.org/10.1016/j.jpsychires.2016.02.023>
- Smith, P. J., & Merwin, R. M. (2021). The role of exercise in management of mental health disorders: An integrative review. *Annual Review of Medicine*, 72, 45–62. <https://doi.org/10.1146/annurev-med-060619-022943>
- Synnestvedt, M. B., Chen, C., & Holmes, J. H. (2005). CiteSpace II: Visualization and knowledge discovery in bibliographic databases. *AMIA ... Annual Symposium Proceedings. AMIA Symposium*, 724–728.
- van de Kamp, M. M., Scheffers, M., Hatzmann, J., Emck, C., Cuijpers, P., & Beek, P. J. (2019). Body- and movement-oriented interventions for posttraumatic stress disorder: A systematic review and meta-analysis. *Journal of Traumatic Stress*, 32(6), 967–976. <https://doi.org/10.1002/jts.22465>
- van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, 84(2), 523–538. <https://doi.org/10.1007/s11192-009-0146-3>
- van Leeuwen, T. (2006). The application of bibliometric analyses in the evaluation of social science research. Who benefits from it, and why it is still feasible. *Scientometrics*, 66(1), 133–154. <https://doi.org/10.1007/s11192-006-0010-7>
- Williams, S. L., & French, D. P. (2011). What are the most effective intervention techniques for changing physical activity self-efficacy and physical activity behaviour—And are they the same? *Health Education Research*, 26(2), 308–322. <https://doi.org/10.1093/her/cyr005>
- World Health Organization. (2018). *Global action plan on physical activity 2018–2030: More active people for a healthier world*. World Health Organization. <https://iris.who.int/handle/10665/272722>
- Wu, H., Li, Y., Tong, L., Wang, Y., & Sun, Z. (2021). *Worldwide research tendency and hotspots on hip fracture: A 20-year bibliometric analysis*. <https://doi.org/10.1007/s11657-021-00929-2>
- Xie, Y., Wu, Z., Sun, L., Zhou, L., Wang, G., Xiao, L., & Wang, H. (2021). The Effects and Mechanisms of Exercise on the Treatment of Depression. *Frontiers in Psychiatry*, 12, 705559. <https://doi.org/10.3389/fpsy.2021.705559>
- Xu, A.-H., & Sun, Y.-X. (2020). Research hotspots and effectiveness of repetitive transcranial magnetic stimulation in stroke rehabilitation. *Neural Regeneration Research*, 15(11), 2089–2097. <https://doi.org/10.4103/1673-5374.282269>

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

