

## REVIEW

### Studying Baduanjin Qigong: A Bibliometric Analysis of Research Trends and Future Prospects

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#### Abstract

*Baduanjin, a traditional Chinese Qigong exercise, has gained increasing scholarly attention for its post-COVID-19 health benefits. This study presents a bibliometric analysis to map research trends, identify influential contributors, and highlight future directions in Baduanjin research. The analysis is based on Scopus-indexed publications from 1982 to 2025, with a total of 525 documents included. The field has expanded rapidly since 2015, with a notable surge after 2021. Zheng G is identified as the most productive author, while Medicine (United States) emerges as the leading publication source. China remains the dominant contributor and central hub of collaboration, particularly with the United States, Malaysia, the United Kingdom, and Canada. Key research hotspots include mental health and well-being, rehabilitation and chronic diseases, traditional Chinese medicine and holistic health, ageing and physical function, and pulmonary rehabilitation. The conceptual structure map reveals Baduanjin's multidisciplinary nature, integrating mental, physical, and therapeutic dimensions. Future research should enhance international collaboration, standardise methodologies, expand its scope among young adults and women, and further explore its role in preventative healthcare and education.*

#### Introduction

Baduanjin, a traditional Chinese qigong exercise, has been practised for over a thousand years and is recognised for its health benefits; also known as the "Eight Pieces of Brocade," its origins date back to the Northern Song Dynasty, where it was developed as a structured health practice rooted in ancient Chinese customs and medical theories (Wen et al., 2024).

Rooted in Traditional Chinese Medicine (TCM) (Guan et al., 2023) and Qigong, Baduanjin integrates physical movements, mental focus, and controlled breathing, embodying both therapeutic and meditative components to promote holistic health (Chen et al., 2024; Zhou et al., 2024). Research attention has rapidly increased, particularly during the COVID-19 pandemic (Reitinger et al., 2021). Practice involves a series of gentle movements and breathing exercises that promote relaxation

#### Keywords:

good health and well-being, quality education, qigong, gender equality, Health, psychological well-being

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and balance. As a low-cost, accessible, and effective health intervention, Baduanjin has been widely promoted for its benefits in physical fitness, mental well-being, and chronic disease management (Chen et al., 2023; Li et al., 2014; Zou et al., 2017).

In China, higher education institutions have increasingly integrated Baduanjin into university programmes, recognising its physical and mental health benefits as part of physical education curricula and health promotion initiatives (Wen et al., 2024; Zhang & Jiang, 2023). Studies have demonstrated that Baduanjin can significantly reduce symptoms of anxiety, depression, and stress while also enhancing physical fitness and body composition among college students (Jiang et al., 2024). Among university students, it serves as an accessible intervention for reducing stress and anxiety, particularly in high-risk groups such as medical students (Zhang et al., 2024). Its contribution to enhancing balance and coordination further reinforces its integration into university sports and wellness initiatives, providing a holistic approach to student well-being. Empirical research highlights the effectiveness of Baduanjin interventions in academic settings. A study at Huanghe Science and Technology College found that students experienced notable reductions in anxiety and depression scores after a two-month Baduanjin intervention (Zhang & Bayasgalan, 2024). Additionally, a 16-week Baduanjin programme for female college students significantly improved physical fitness parameters, including vital capacity, grip strength, and endurance, alongside mental health benefits (Zhao et al., 2024). These results substantiate the viability of Baduanjin as a feasible and economically accessible form of physical exercise that can be implemented in higher education institutions to promote physical and psychological well-being.

While research has highlighted its potential in therapy in any global academic context, Baduanjin has attracted increasing research attention on several fronts,

particularly medicine, sports training, and psychology (Sun et al., 2022; Zheng et al., 2019; Zou et al., 2024). Current studies have shown the efficacy of Baduanjin in cardiovascular health, stress reduction, and chronic disease management. Hence, it has been incorporated into rehabilitation programmes, elderly care, and treatment management (Li et al., 2024). The progress in publishing traditional Chinese exercises like Baduanjin has been steady, especially in stroke rehabilitation and musculoskeletal disorders (Tan et al., 2024). Baduanjin has shown significant health benefits for general recovery in different populations. It has been effective at easing mood disorders in perimenopausal women, with 63.64% of studies reporting positive effects on mental health (Liu et al., 2024). The combination of Baduanjin with resistance training has helped reduce anxiety and depression in patients suffering from haematological malignancies (Shen et al., 2024). Studies on how Baduanjin improves cognitive function, especially in older people, have linked it to improved brain connectivity and increased grey matter volume (Zhao, 2024). It has been demonstrated to be a safe exercise and an effective means of curbing depression and anxiety during the COVID-19 pandemic (Huang et al., 2024). Studies also suggest it may be a potential intervention for weight management, especially in obese and overweight populations (Gao et al., 2024).

Although there is increasing interest in Baduanjin, key research gaps, emerging themes, and influential works remain underexplored. To the best of our knowledge, this is the first study to conduct a comprehensive bibliometric analysis in Baduanjin, systematically examining its current status and providing insights into its future directions. Building on this, this study aims to bridge this research gap through comprehensive bibliometric analysis, which provides a structured overview, identifying research gaps and promoting a unified understanding of Baduanjin's health benefits.

#### Research Questions:

1. What are the global trends in Baduanjin research?
2. Which authors, institutions, and countries significantly influence Baduanjin research?
3. What are the key research hotspots and potential future research directions?

#### Methods and Materials

Bibliometric analysis is an increasingly popular and thorough technique for examining and assessing massive amounts of scientific data and is becoming more common in scientific research (Passas, 2024). Bibliometric analyses have been applied to map the state of the arts in various fields (İri & Ünal, 2024; Oliveira et al., 2019). It can effectively summarise research trends and avenues for future study on Traditional Chinese Exercises (TCEs) (Li et al., 2024). In this context, bibliometric analysis emerges as an essential tool, generating insights into the research landscape, identifying trends, and highlighting gaps in the literature (Choudhri et al., 2015). Recent reviews highlighted the use of Baduanjin in traditional Chinese Medicine (McGee, 2020) and its extensive clinical research (Zhou et al., 2020).

#### Search Strategy

We systematically retrieved literature in the Scopus database for bibliometric analysis of Baduanjin. The Scopus was used because of its comprehensive coverage of multidisciplinary work and quality-assured indexing of scholarly publications (Maridueña et al., 2024; Velasco-López et al., 2023). This database has extensive coverage of peer-reviewed literature, including journals, and conference proceedings, providing a sound basis for bibliometric analysis, including health sciences (Vieira & Gomes, 2009), sports science (Lei & Yu, 2012) and physical activity (Khatra et al., 2021; Zhang et al., 2022).

Using Boolean operators (Aromataris & Riitano, 2014; Carcassi & Sbardolini, 2023), the search strategy systematically combined the Baduanjin-related keywords and their synonyms to ascertain whether relevant studies exist. These are often used within search queries to refine results, combining keywords with AND, OR, and NOT to enhance the precision of information retrieval (Jakobovic et al., 2021). The specific search terms included: TITLE-ABS-KEY ( ( "Baduanjin" OR "Ba Duan Jin" OR "Eight Brocades" OR "Eight-Section Brocade" OR "Eight Silken Movements" OR "Eight Pieces of Brocade" OR "Eight-Section Exercise" OR "Eight Silken Exercises" OR "Brocade Exercise" OR "Eight-section Brocade" OR "Baduanjin exercise" OR "Eight Pieces of Silk" OR "Eight Treasures" OR "Eight Movements" OR "Ba Duan Jin Qigong" OR "Eight Silken Weaving" ) ). The search strategy on February 7, 2025, covered articles published between 1982 and 2024. The initial search returned 607 documents. We included only articles (405), review papers (150), conference papers (33), and book chapters (6), yielding a total of 594 publications after filtering by document type. After that, we excluded 69 documents not in English, resulting in a final analysis dataset of 525 records. The flow diagram of the search strategy, adapted from Zakaria et al. (2020), is illustrated in Figure 1.

Despite the robust methodology employed in this bibliometric analysis, certain limitations should be acknowledged. One limitation is the exclusive use of the Scopus database, which, while comprehensive, may exclude relevant studies indexed in other databases such as Web of Science or PubMed. Secondly, the inclusion criteria restricted the analysis to articles written in English, potentially omitting valuable contributions in different languages and limiting the diversity of perspectives.

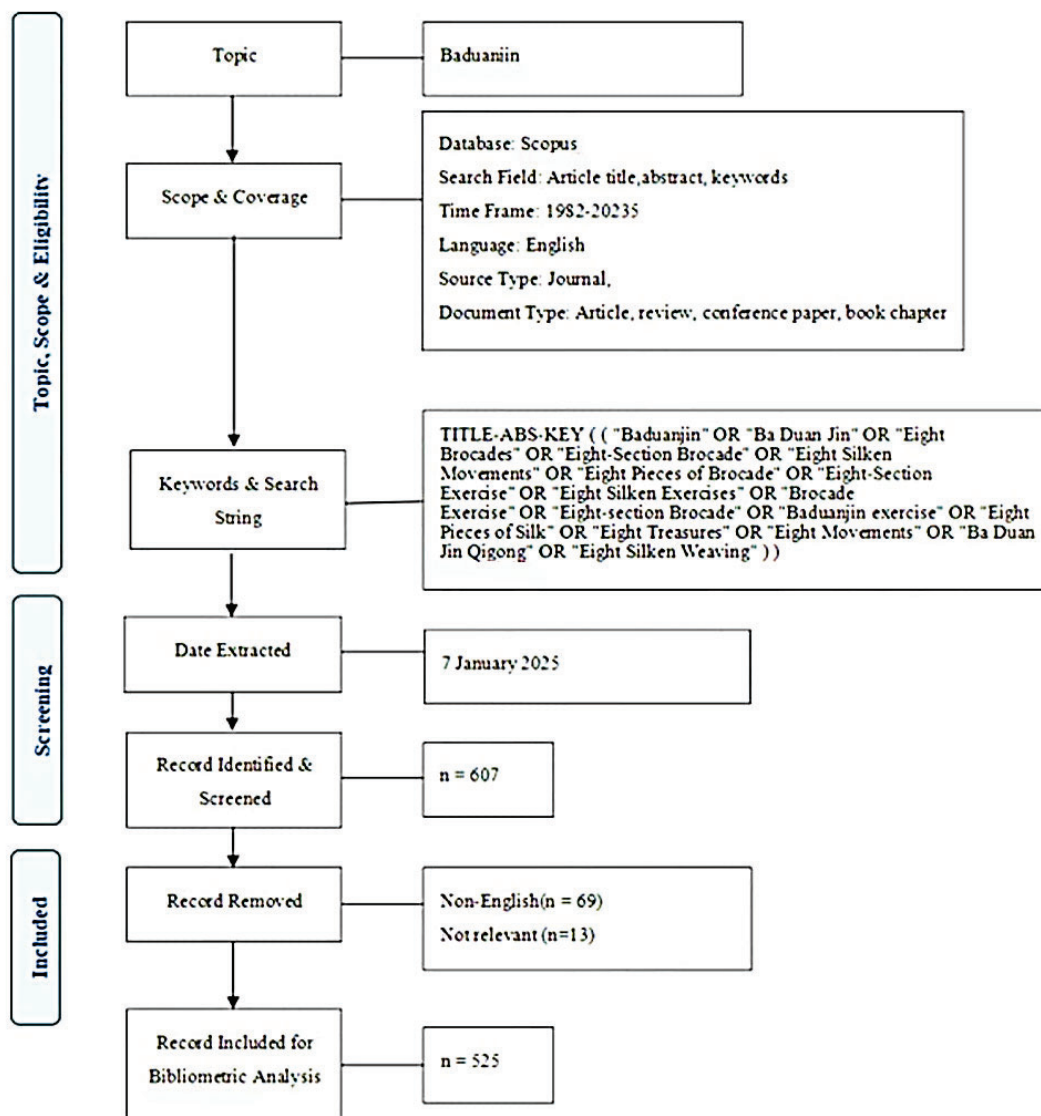


Figure 1. Flow Diagram of the Search Strategy

Lastly, the study's reliance on quantitative metrics, such as citation counts, may overlook the qualitative significance of certain works, potentially biasing the interpretation of research trends.

### Data Analysis

Two tools, VOSviewer (version 1.6.20) (Eck & Waltman, 2009) and Biblioshiny, were used to analyse current trends, contributing indicators, and future directions of Baduanjin-related research. Biblioshiny is a web-based application that serves as an interface for the R package

Bibliometrix, designed to facilitate bibliometric analysis (Tomaszewski, 2023). Biblioshiny was used to generate descriptive statistics analyse and visualise key bibliometric indicators, including annual publication trends, annual scientific production, authors' production over time, sources, countries, collaboration patterns, and the conceptual structure map. (Moral-Muñoz et al., 2020; Nizaruddin et al., 2024).

On the other hand, the co-occurrence network was specifically analysed and visualised using VOSviewer, allowing for a

detailed exploration of the relationships between keywords and concepts. VOSviewer is free software developed by Leiden University for constructing and visualising bibliometric networks, known for its capability to create network-based maps for bibliometric analysis (Husaeni, 2023; Kirby, 2023) ([www.vosviewer.com](http://www.vosviewer.com)). It provides a graphical representation that helps understand the structure and dynamics of scientific research fields (Arruda et al., 2022).

## Results

### Annual Publication

Scientific reporting on Baduanjin research has shown an increase over the last few decades. As shown in Figure 2, research on Baduanjin has evolved gradually since the 1980s, but has expanded since 2015. The number of publications rose sharply after 2020, peaking in 2024. This upward trajectory reflects the increasing academic and clinical interest in Baduanjin as a multidisciplinary health practice.

### Main contributors

#### Author:

The authorship analysis, as observed in Figure 3, reveals the most prolific individuals in Baduanjin studies. In the number of publications, Zheng G led with

30, followed by Chen X in second place with 25. Other notable contributors include Wang Y, with 23 publications, and Zhang Y and Liu J, with 22 publications each. The coloured timeline illustrates the chronological consecutive releases of these publications over time, with a notable group of other leading authors who have established themselves in the field. The larger and darker bubbles represent years of research activity that make a bigger contribution to academia. In the case of co-authorship, the fractional contribution score denotes the actual degree of impact made by every researcher. Zheng G has the highest fractional contribution at 4.78, followed by Wang J at 3.94, Wang Y at 3.46, and Zhang Y at 4.19.

### Source:

Analysis of the publication sources (see Figure 4) indicates the following foremost journals publishing Baduanjin research. These include, in order of production, *Medicine, Evidence-Based Complementary and Alternative Medicine*, *BMJ Open*, and *Frontiers in Public Health*. Also of significance are *BMC Complementary Medicine and Therapies*, *International Journal of Environmental Research and Public Health*, and *Trials in Clinical Research*.

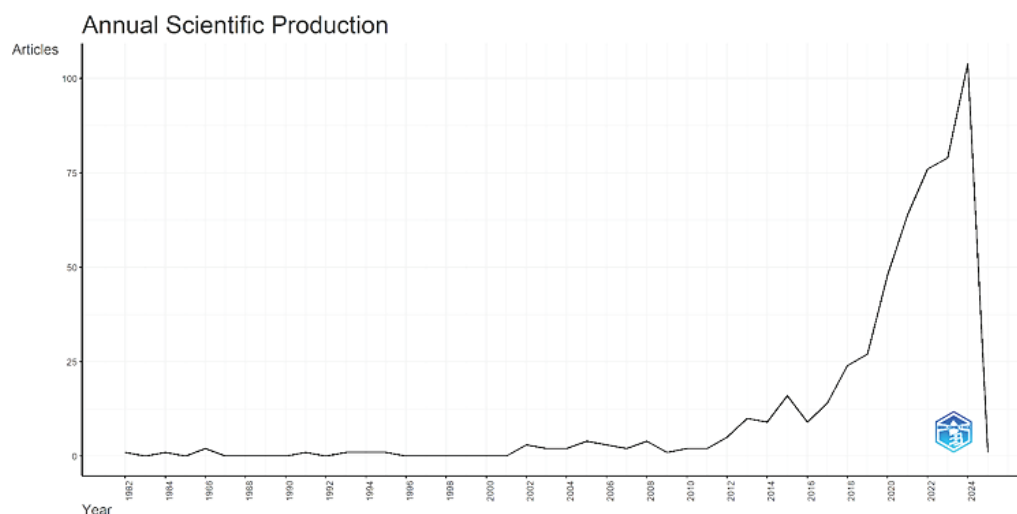


Figure 2. Annual scientific production

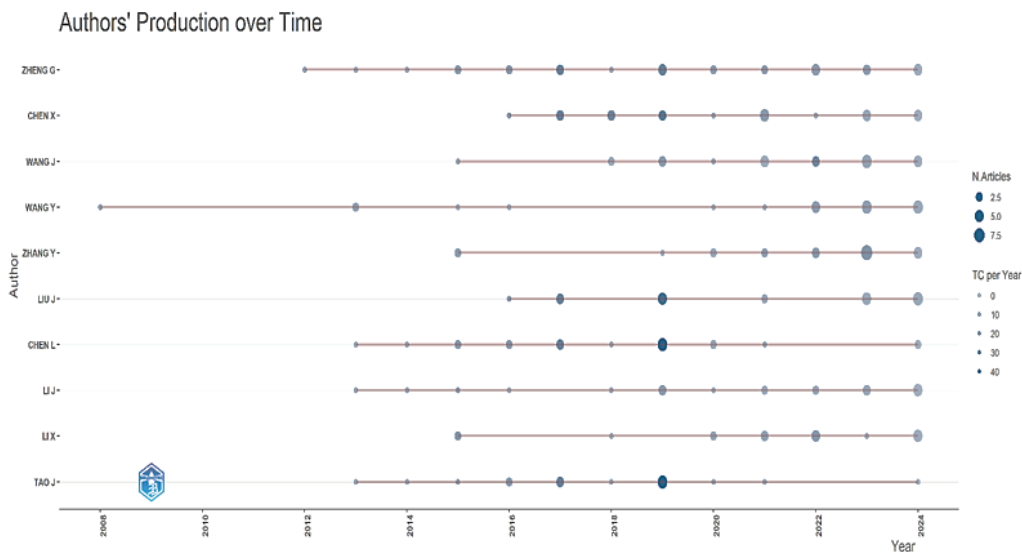


Figure 3. Authors' Production over Time

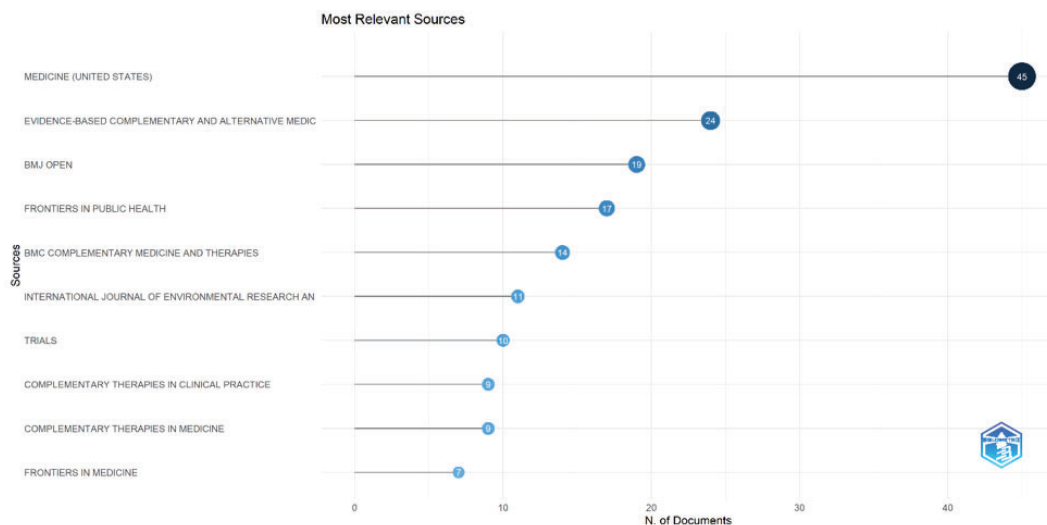


Figure 4. Most Relevant Sources

The sources point to complementary and alternative medicine journals, public health journals, and journals targeting clinical practice as the predominant publishers of Baduanjin, suggesting its interdisciplinary base and healthcare relevance.

### Countries:

According to Figure 5, China (including Hong Kong) remains the central hub of Baduanjin research, contributing over two-thirds of the total publications (372). The United States, Malaysia, Canada, and Australia also demonstrate notable

participation, indicating emerging international collaboration. Most publications from China (Hong Kong) are single-country or SCPs (299 articles, accounting for 80.38%), implying that many of these works have been done in their home countries. On the other hand, 73 articles (19.62%) show that many of these collaborations are Multiple-Country Publications, MCPs, which reflect growing international research collaborations.

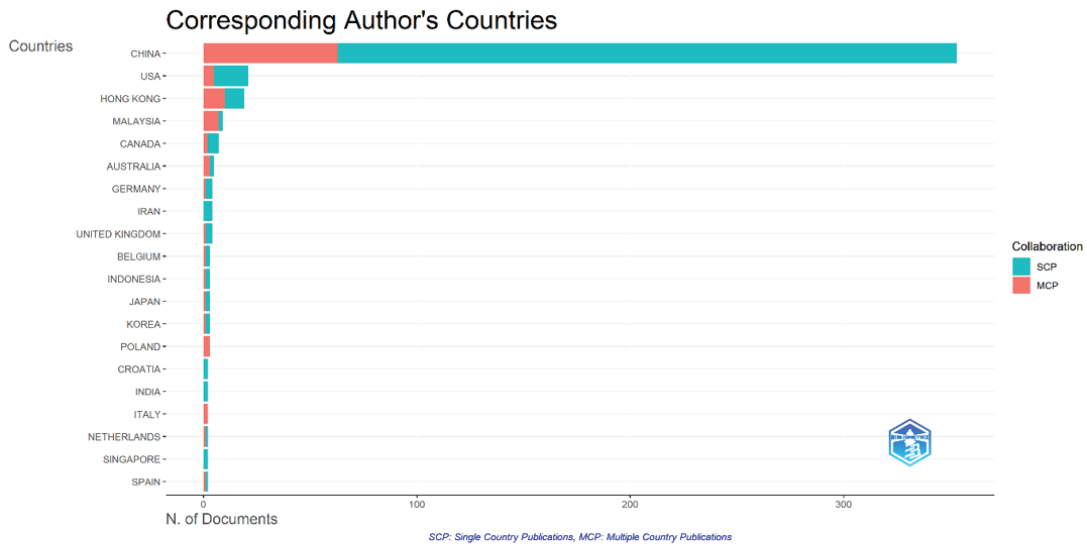


Figure 5. Corresponding authors' Countries

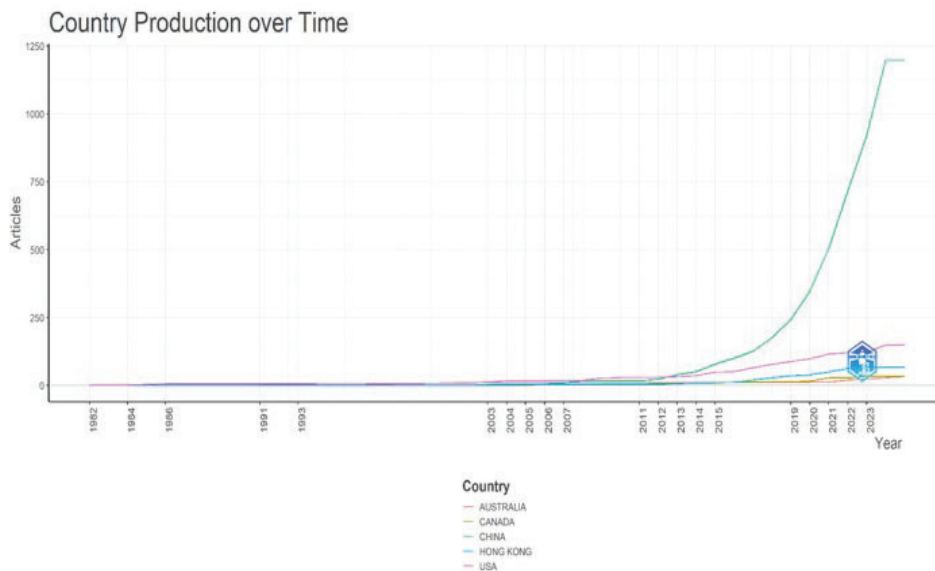


Figure 6. Country production over time

According to Figure 6, country-wise publication trends on Baduanjin research reflect different growth patterns from the major contributors. Research output has grown exponentially in China and Hong Kong since 2015. In 2024, the overall publications reached 1,266. The rate of growth can be noticed from 2016 (China: 101, Hong Kong: 11) through 2020 (China: 348, Hong Kong: 40), followed by a very rapid increase in recent years (China: 921 in 2023, Hong Kong: 67). The USA has shown a fluctuating upward trajectory,

reaching its highest publication figure of 149 in 2024 and 2025. Research output in that country increased from 49 articles in 2015 to 116 in 2021. In comparison, Australia and Canada have portrayed relatively stable growth paths, but also in a more moderate manner. Australia oscillates between producing about 11 and 34 articles annually, slightly increasing in 2024 (28) and 2025 (34). Canada's research output has gradually increased, reaching its peak at 35 articles in 2025 after rising from 14 articles in 2018 to 28 in 2021.

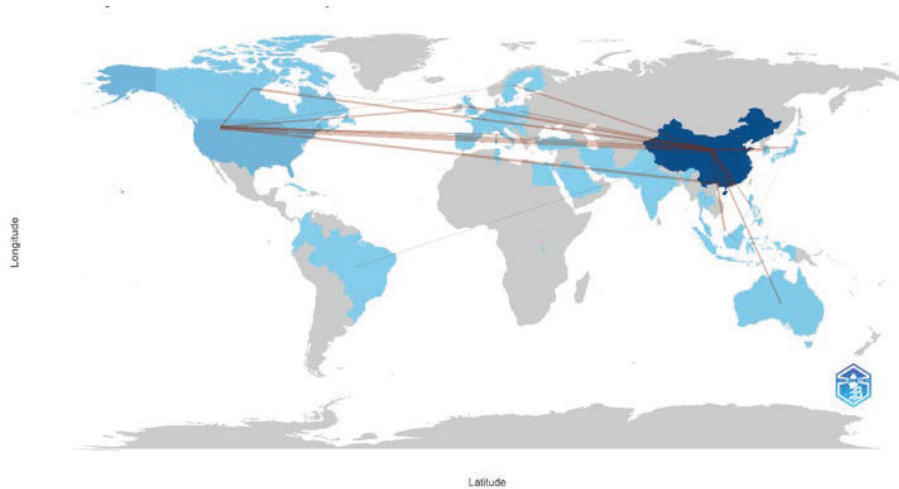


Figure 7. Country collaboration map

As demonstrated in Figure 7, the collaboration network illustrates international research partnerships with China (including Hong Kong), which serves as the central hub of collaboration, aligning with several countries in Asia, North America, and Europe. The predominant collaboration occurs between China (including Hong Kong) and the United States, comprising for 57 studies (including co-publishing 38 from China and 19 from Hong Kong). Other significant collaborations involve China (including Hong Kong), Malaysia, the United Kingdom, and Canada; Australia and Germany are also involved, with fewer partnerships. The map highlights that China, including Hong Kong, plays the most central role in collaborations, while international partnerships remain limited, as a sizable chunk of studies are still Single Country Publications (SCP) and not Multiple Country Collaborations (MCC).

#### *Trend:*

In the study of Baduanjin, as reflected in Figures 8a and 8b, VOSviewer network visualisation describes the co-occurrence relationships between prominent terms in detail. In this network, each node represents a specific keyword, and the size of the node corresponds to its popularity in academic literature. The lines connecting the nodes

show the strength of their co-occurrence relationships, with different colours signifying clusters of thematically related subjects, facilitating an intuitive understanding of the research landscape. The central and widespread terms suggest that "Baduanjin" is the most popular term, appearing 134 times with a total link strength of 254. From here, it gets its most central position in the research domain. Other terminology includes "Baduanjin exercise" (49 occurrences, strength of 83) and "Baduanjin Qigong" (8 occurrences, strength of 11), all denoting variations in the terminology used to refer to the practice. Another frequently occurring linked term is "Qigong" (42 occurrences, strength of 90), further reinforcing its close association with Baduanjin.

The thematic cluster analysis identifies several key domains in Baduanjin's research. Mental Health and Well-being (Red Cluster): Keywords like "depression" (26 occurrences, 62 link strength), "anxiety" (15 occurrences, 47 link strength), "quality of life" (28 occurrences, 59 link strength) indicate that psychological health benefits are receiving considerable research attention in Baduanjin. This cluster encompasses studies of Baduanjin, which are offered in conjunction with other therapies to improve mental health and quality of life.



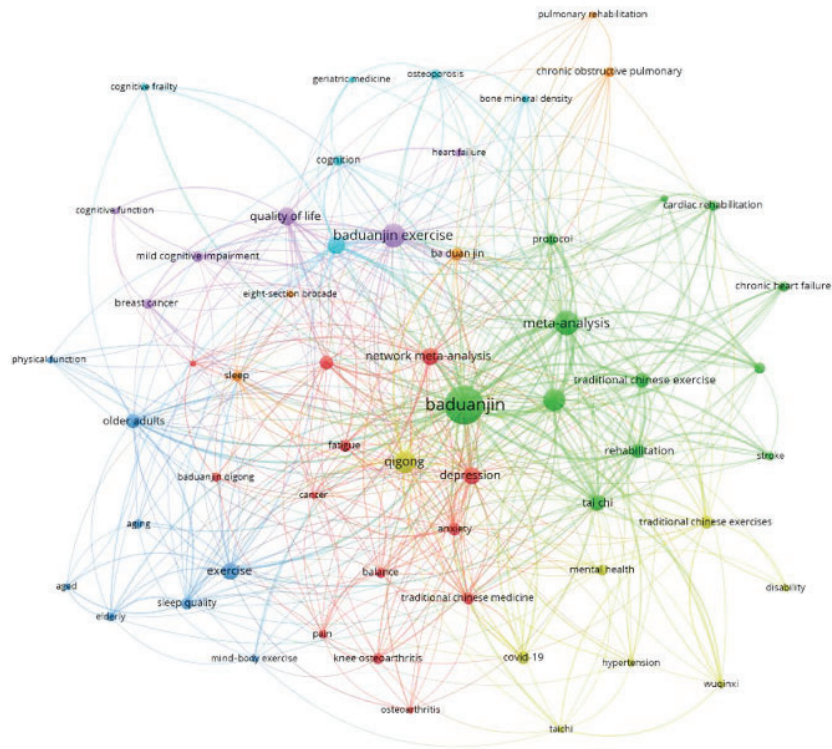


Figure 8b. Co-occurrence Network

Pulmonary and Chronic Conditions (Orange Cluster): Emerging research trends in respiratory and chronic conditions are reflected in keywords such as "pulmonary rehabilitation" and "chronic obstructive pulmonary disease". This suggests an increased interest in Baduanjin's support for pulmonary rehabilitation and respiratory health management.

The Conceptual Structure Map (Figure 9), constructed using Multiple Correspondence Analysis (MCA), presents the central research themes and relationships among the Baduanjin-related studies. A significant mapping area categorisation sheds light on the keywords, showing diverse but interrelated research areas that reflect various aspects of Baduanjin research, which remains multidimensional.

"Central inside the map are 'Baduanjin,' 'Qigong,' and 'exercise' that is coupled with terms like 'mental health,'

'psychology,' and 'physical activity,'" proving Baduanjin is essentially explored for its effects on mental as well as physical health. The connection with terms like 'anxiety,' 'depression,' 'cognition,' and 'quality of life' demonstrates a high emphasis on the psychological and cognitive benefits of Baduanjin, emphasising its meaning as an adjunct treatment method for mental disorders.

The names "randomised controlled trial," "systematic review," "clinical effectiveness," and "therapy" located in the areas adjacent to the central cluster indicate a trend toward empirical validation and evidence-based research. These terms suggest that Baduanjin is typically studied within a clinical trial framework, describing its endeavours to establish efficacy within preventive and therapeutic settings. It's also worth noting that the association with "Chinese medicine," "Tai Chi," and "traditional therapy" emphasises the deep rooting of Baduanjin in Traditional Chinese



integrated intervention for this demographic.

For females, their placement near "clinical article," "randomised controlled trial," and "priority journal" underscores their significance in high-quality empirical research. This positioning suggests that women are frequently the focus of studies exploring the dual benefits of Baduanjin for physical rehabilitation and psychological well-being. The proximity to "mental health" and "physical activity" further indicates that research involving women often evaluates the integration of traditional health practices into clinical and therapeutic contexts. This gender-sensitive approach highlights the importance of addressing women's unique health challenges through culturally adaptive and scientifically validated interventions.

Together, the positions of "young adults" and "female" reveal a nuanced understanding of the role of Baduanjin in addressing diverse health needs across age and gender dimensions, emphasising its versatility as a health practice.

## Discussion

This bibliometric analysis of Baduanjin research portrays its evolution as an integrative health practice, straddling the realms of traditional and modern medicine. Findings reveal its multidisciplinary nature, covering mental health, physical rehabilitation, chronic disease management, and Traditional Chinese Medicine.

### *Expanding Evidence-Based Research*

The increase in randomised controlled trials, systematic reviews, and meta-analyses has directed a shift toward evidence-based medicine. Baduanjin is part of therapeutic schemes for chronic heart failure, stroke, and cardiac rehabilitation, serving as an example of its movement from traditional practice to scientific validation. Nevertheless, methodological inconsistencies, heterogeneous designs of studies, and lack of validation through

large-scale, long-term follow-up trials limit the acceptance of it in mainstream medicine. To provide robust evidence, future research needs to standardise further intervention guidelines, multi-centre clinical trials, and objective biomedical and neuroimaging assessment.

### *Integration of Traditional and Modern Medicine*

Despite a growing body of scientifically credible support, Baduanjin remains deeply rooted in TCM, as shown by its association with "Traditional Chinese Medicine," "Tai Chi," and "traditional therapy." Such dual identity presents opportunities and challenges: with its cultural foundation, it has a rich basis for health applications, yet it faces slow integration into global healthcare systems. Interdisciplinary collaboration will blend TCM principles with modern biomedical research, creating a structured and well-accepted health intervention.

### *Expanding Target Populations Beyond the Elderly*

Traditionally, Baduanjin's research has focused on older populations, particularly in fall prevention, mobility improvement, and cognitive function enhancement. However, analyses through the Conceptual Structure Map and VOSviewer have shown a shift toward young adults, women, and working professionals, with growing attention to stress management, mental health, and workplace well-being. In China, Baduanjin is the foremost intervention for student health and psychological resilience in university contexts. Many universities have included Baduanjin practice in their PE curriculum, mental health programmes, or USAC activities to help students ameliorate academic stress, develop emotional resilience, and improve physical health. This expansion exemplifies Baduanjin's preventive and health-promoting role among younger populations and showcases its realisable integration into global education systems. Future research

should highlight population-based interventions to ensure widespread adaptation across demographics. Comparison with other mind-body interventions, Tai Chi, yoga, and physiotherapy can clarify the therapeutic benefits of Baduanjin.

#### *Applications in Preventive Medicine and Public Health*

Contrasting research on Baduanjin indicates its promise in ageing, cognitive function, and pulmonary rehabilitation. Keywords such as "pulmonary rehabilitation" and "chronic obstructive pulmonary disease" indicate growing academic interest in its role in respiratory health and post-COVID rehabilitation. Future studies should explore its expansion into primary healthcare, corporate wellness programmes, and community-based interventions. With its low cost and accessibility, Baduanjin can be a scalable public health strategy, particularly in countries where cost-effective solutions remain underexplored.

#### *Global Research Venture*

Baduanjin's research remains heavily concentrated in China, limiting its utility and relevance for international collaboration. North America, Europe and Australia have done little to amalgamate practice into efficient healthcare systems. Research in this area requires, in the future, close collaborative work between countries to widen participant populations and diversify methodologies, more interdisciplinary collaborations that will integrate various forms of traditional medicine with modern biomedical sciences, and flexible and aggressive international funding strategies to support multinational studies and mega-scale clinical trials. Increased international efforts are needed to transform Baduanjin from a local practice into a globally accepted health intervention.

Baduanjin's research has gained significant academic acceptance in clinical practice and mental health, physical

rehabilitation and chronic disease control, which promises broad application. Though it has gained wide acceptance, issues such as methodological standardisation, international collaboration, and population diversity remain unresolved as continuing areas for research. Future research should ensure more excellent evidence, expand clinical and public health applications, and enhance global collaborations. Addressing these areas will help Baduanjin evolve from a time-honoured traditional healing practice into a rigorously validated, internationally accepted mind-body intervention.

Baduanjin is becoming increasingly important in global health, education, and rehabilitation. Its application has been documented in China and other countries such as Australia, the United States, and Europe. Baduanjin has been integrated into programs to prevent chronic diseases, provide mental health support, and promote community wellness (Zhou et al., 2020). Baduanjin is easy to learn and practice, relatively inexpensive, and requires little to no equipment, making it attractive for international health promotion and as a culturally sensitive intervention model (Zou et al., 2019). The use of Baduanjin in interdisciplinary health programs, as well as in care for older people and in digital health, further enhances its importance in public health. These observations indicate a change in scientific research on martial arts intended to adapt traditional forms to contemporary global circumstances, placing Baduanjin alongside other cross-cultural movement practices (Bailey & Samsudin, 2025).

#### *Limitations of the Study*

This study has several limitations that should be acknowledged. First, the analysis relied exclusively on the Scopus database, which, although comprehensive, may have omitted relevant studies indexed in other databases such as Web of Science or PubMed. Second, only English-language publications were included, which might limit the diversity of perspectives and

exclude valuable research published in other languages. Third, the study focused on quantitative bibliometric indicators without assessing the methodological quality of individual studies, which may affect the interpretation of research trends. Future research could address these limitations by integrating multiple databases, including non-English sources, and incorporating quality assessment tools to provide a more holistic understanding of Baduanjin research.

### Conclusion

Baduanjin has become a multidisciplinary study area, integrating traditional Chinese medicine with modern biomedicine. Baduanjin demonstrates considerable potential for preventive medicine and public health, particularly in managing chronic diseases and supporting post-COVID rehabilitation. Nevertheless, the research mainly concentrates on China, calling for more international collaboration. Its study has been associated with evidence-based medicine; however, methodological inconsistencies and lack of large-scale validation may limit its acceptance. Expanding target populations, notably young adults, college students, and working professionals, signify its developing role in stress management in the workplace and educational settings. Future work should put a stronger emphasis on standardisation, clinical trials on a larger scale, and interdisciplinary integration to solidify Baduanjin as a credible mind-body intervention.

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