

Scholarly Trends in Integrative Medicine from Islamic Perspectives: A Bibliometric Analysis

Nur Ain Mahat¹, Wan Hasliza Wan Mamat², Nurasikin Mohamad Shariff³, Sharifah Munirah Syed Elias⁴ and Rafiq Sumardi Omar⁵

Abstract

Integrating conventional medicine with complementary and alternative therapies creates a comprehensive approach to healing. It is used worldwide to treat illnesses and improve health. The World Health Organisation recognises these treatments as significant and expanding globally. Integrative medicine, which promotes holistic healing, aligns well with the principles of Islam. Despite its growing popularity, there is limited scholarly exploration of integrative medicine through the lens of Islamic perspectives, which encompass a rich traditional medical practice deeply rooted in religious teachings. This quantitative-qualitative analysis used bibliometric and content analytics to investigate integrative medicine literature trends in Scopus. Based on bibliometric performance study of 1466 papers, the US, China, India, and Iran are the most productive integrative medicine research centres with the most relevant institutions. An in-depth review of integrative medicine research's growth will help healthcare practitioners grasp the issue and stimulate empirical research to improve integrative patient care.

Keywords: *Bibliometric Analysis, Integrative Medicine, Traditional and Complementary Medicine, Alternative Medicine, Islamic Perspectives*

INTRODUCTION

The term "Integrative medicine" refers to a holistic approach to healthcare that integrates conventional medicine with complementary and alternative therapies (Mukhopadhyay et al., 2022). Complementary and Alternative Medicine (CAM), also known as Traditional and Complementary Medicine (T&CM), comprises therapeutic interventions that function as supplementary approaches to conventional medicine and are not typically covered in medical curriculum (Lesley Rees & Andrew Weil, 2001). Integrated medicine transcends the realm of disease and treatment by emphasising health and restoration as its primary goal and importance. It takes into account the spiritual as well as physical aspects of patients and integrates these into the diagnosis and treatment process. The World Health Organization (WHO) has recognised the importance and global expansion of T&CMs (WHO Global Report on Traditional and Complementary Medicine, 2019). Meanwhile, the Ministry of Health Malaysia (MOH) has long acknowledged the multifaceted importance of T&CM, encompassing health, economics, society, and culture. In order to ensure comprehensive healthcare coverage for all Malaysians, MOH advocates for the integration of secure and high-quality T&CM services into the public healthcare system (T. & C. M. Division, 2017; T. & C. M. Division, 2015). Additionally, integrative medicine, with its focus on a holistic approach to healthcare, aligns well with the principles and teachings of Islam (Al Khayat, 1997; AlRawi et al., 2017; Attewell, 2006; Elvina, 2020; Fadel, 2008; Khalil et al., 2018; Nagamia, 1996; Saniotis, 2012). Islam emphasises the importance of nurturing the body, mind, and soul to achieve holistic well-being. The emergence of integrative medicine, encompassing both conventional and complementary practices, is in consistent with the 2030 Agenda for Sustainable Development, SDG3 which prioritises the advancement of health and wellbeing for all age groups.

¹ Department of Professional Nursing Studies, Kulliyah of Nursing, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, Bandar Indera Mahkota, 25200 Kuantan, Pahang, Malaysia E-mail: nurainmahat@iiu.edu.my / nurain.mahat@gmail.com (Corresponding Author)

² Kulliyah of Nursing, International Islamic University Malaysia, 25200 Pahang, Malaysia

³ Kulliyah of Nursing, International Islamic University Malaysia, 25200 Pahang, Malaysia

⁴ Kulliyah of Nursing, International Islamic University Malaysia, 25200 Pahang, Malaysia

⁵ Gleanegles Jerudong Park Medical Centre, Bandar Seri Begawan BG3122, Brunei Darussalam

Hence, this study reviews the literature on integrative medicine from the Islamic perspectives, identifies their thematic progression, and provides directions for potential imminent research within this area. This review utilised a quantitative-qualitative approach that combined a bibliometric analysis method with a content analysis process. Understanding trends within the subject area, investigating its intellectual and conceptual frameworks, and conducting a critical assessment of the current state of scholarly contribution are all aspects that constitute the significance of this contribution.

There are six sections in this study, starting with the introduction. Section two describes the methodology and the process of designing the review. Section three highlights the key findings of the bibliometric performance analysis. Section four details the findings regarding bibliometric network map analysis of integrative medicine literature. Section five provides an in-depth discussion of the major findings. The study's conclusion and suggestions for further research are provided in section six.

METHODOLOGY

The bibliometric review conducted in this study encompassed three stages of systematic process:

Set the search process as follows:

- i. Identified the bibliographic database and integrated the relevant keywords into a well-constructed search statement.
- ii. Introduced the relevant inclusion and exclusion criteria to refine the scope of literature coverage, ensuring the derivation of the final dataset for review.

Bibliometric analysis:

- i. Performed a Bibliometric Performance Analysis (BPA) to identify the most important research components present in the literature of integrative medicine. This analysis utilised the citation analysis method accessible through VOSviewer.
- ii. Performed a Bibliometric Network Analysis (BNA) to elucidate the intellectual, social, and conceptual structures within the literatures on integrative medicine.

Utilised a content analysis process on the dataset to explore the key research themes within the literature on integrative medicine.

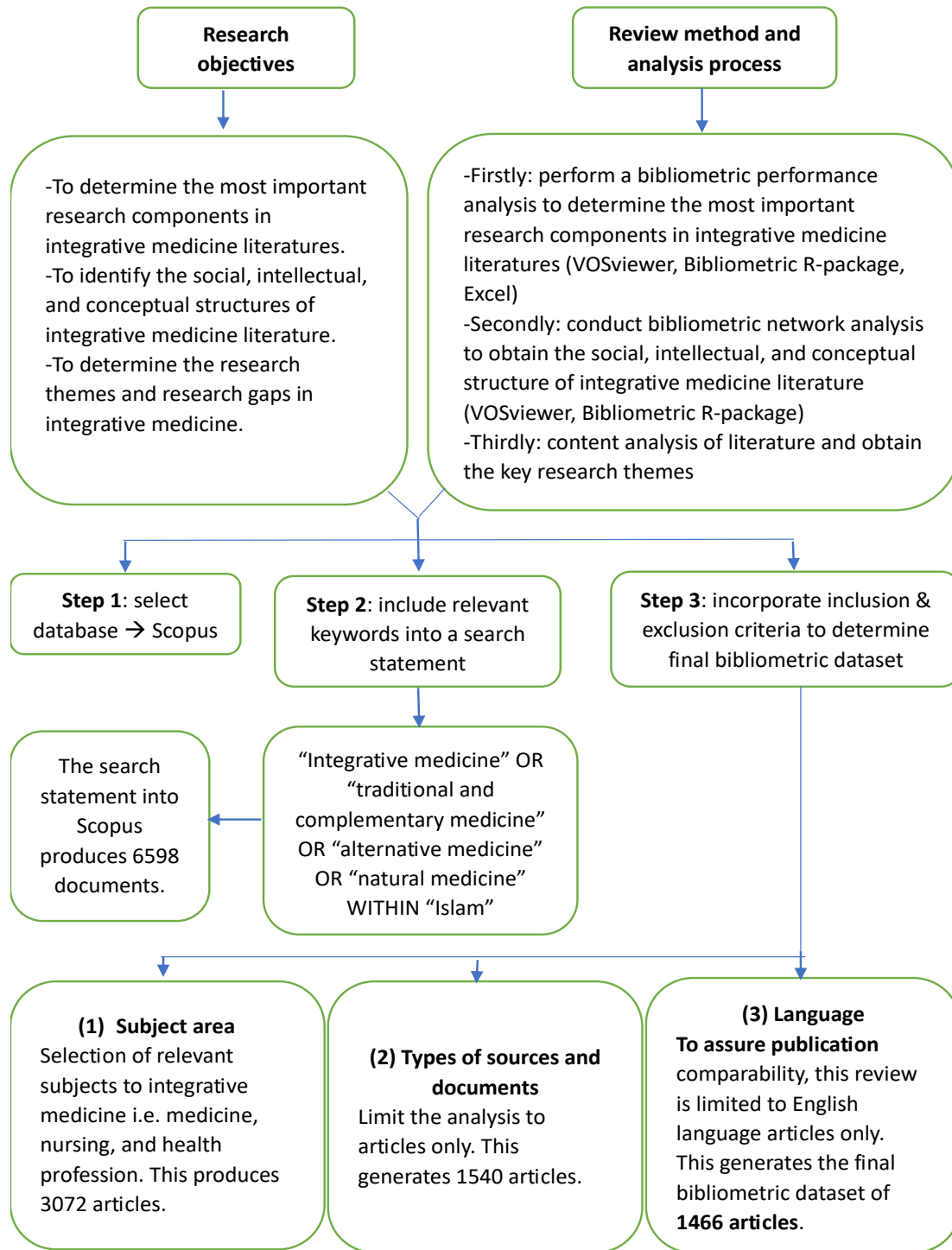


Figure 1: The methodological process.

Set the Search Process

This study established a systematic approach for generating bibliometric data by selecting a database and subsequently identifying, specifying, and incorporating the most pertinent integrative medicine keywords into a coherent search statement. Scopus is selected for its reliability and credibility as a source of bibliometric data. It is the most extensive database of curated abstracts and citations, encompassing scientific journals on a global

and regional scale. Furthermore, the inclusion for publication in the Scopus database is governed by stringent content selection criteria with ongoing re-evaluation procedures.

In this bibliometric analysis, the search statements included “integrative medicine” OR “traditional and complementary medicine” OR “alternative medicine” OR “natural medicine”. The search is limited to “within Islam” to focus on the Islamic-related perspectives. The Boolean operator "OR" is used to broaden the scope of the literature reviewed without restricting it to a specific timeframe. This process resulted in 6598 articles as a primary sample.

A set of pertinent inclusion and exclusion criteria were applied into the primary sample to ascertain the scope and validity of the bibliometric review findings. Irrelevant disciplines were omitted, retaining only relevant scientific fields such as medicine, nursing, and health professions. This study is strictly limited to articles published in reputable scientific journals. In addition, this review is limited to articles written in English language in order to effectively incorporate a multi-perspective comparability across publications. In total, 1466 publications were included in the final sample of bibliometric data.

Bibliometric Analysis [Bibliometric Performance Analysis (BPA) and Bibliometric Network Analysis (BNA)]

Bibliometric analysis is a rigorous quantitative method used to examine extensive repositories of scientific data. It involved a systematic, transparent, and reproducible evaluation process through the utilisation of statistical measurement. Research methodology comprised of distinct approaches aimed at examining the social, intellectual, and conceptual frameworks of a specific field within the existing body of literature. The purpose is to highlight key research components, obtain a comprehensive understanding of the subject matter, identify pertinent research gaps, develop novel concepts for future research work, and determine researchers' contributions in their respective scientific disciplines.

The bibliometric analysis techniques are objective, which include determining publication count, number of citations, keyword occurrences, and other factors. Nevertheless, the analysis may be subjective when qualitative methods such as thematic analysis are used. Bibliometric analysis consists of two phases: Bibliometric Performance Analysis (BPA) and Bibliometric Network Analysis (BNA). The BPA seeks to identify key research elements in integrative medicine literature, such as leading countries, institutions, journals, authors, and articles. On the other hand, the BNA helps identify the intellectual structure (e.g., through co-citation analysis), the social structure (e.g., through co-authorship analysis), and the conceptual structure (e.g., through thematic map analysis, title, and abstract map analysis).

This bibliometric review utilised three analysis tools: VOSviewer, Bibliometrix R-package, and Microsoft Excel. Both VOSviewer and the Bibliometrix R-package helped create, visual and analyse the diverse bibliometric network maps, thereby providing the essential functions and options required to perform BNA, while Microsoft Excel and the Bibliometrix R-package were utilised for BPA (Kashi & Shah, 2023).

Content Analysis

Following BPA and BNA analyses, content analysis was performed in the third phase to evaluate, analyse, and synthesise the bibliographic dataset. The content analysis of the publication focused on the emerging clusters or themes from scholarly articles based on the existing keywords such as “integrative medicine”, “traditional and complementary medicine”, “alternative medicine” and “natural medicine”. Integrating qualitative content analysis with quantitative bibliometric method enhances credibility and reliability through triangulation of the findings. The results of the integrative thematic analysis could strengthen the descriptive characteristics and systematic approach of the bibliometric review.

Bibliometric Performance Analysis (BPA)

The results of the bibliometric analysis pertaining to integrative medicine are presented in this section.

Most Influential Countries and Institutions

This section examined the geographical distributions of publications through analysis of the countries associated with the authors' affiliations. Analysing the countries of origin provides important insights into the global scale of the field under study, as well as highlighting international partnerships and trends. Figure 2 illustrates the distribution of single-country publications (SCPs) and multi-country publications (MCPs). Both SCPs and MCPs represented the two types of publications that made up the total number of publications from each country. In the USA, the vast majority of publications were authored by individuals from a single country. Similarly, the majority of publications in China, India, and Iran were classified as SCP. Meanwhile, the UK and Germany showed various distributions of SCP and MCP, implying diverse collaboration between authors globally. In countries such as Indonesia, Korea, and Turkey, SCPs made a substantial contribution, with the majority of the publications being authored by local authors. Figure 3 reveals that the USA, China, and India were the top three most cited countries, followed by Canada and Iran.

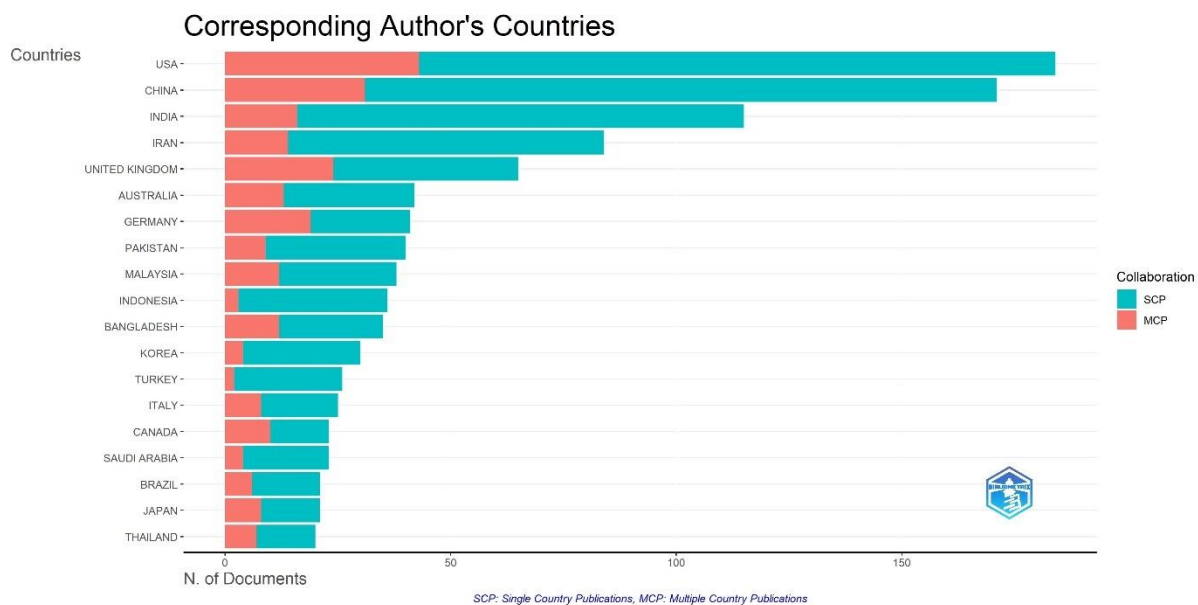


Figure 2: The distribution of Single Country Publications (SCPs) and Multiple Country Publications by countries.

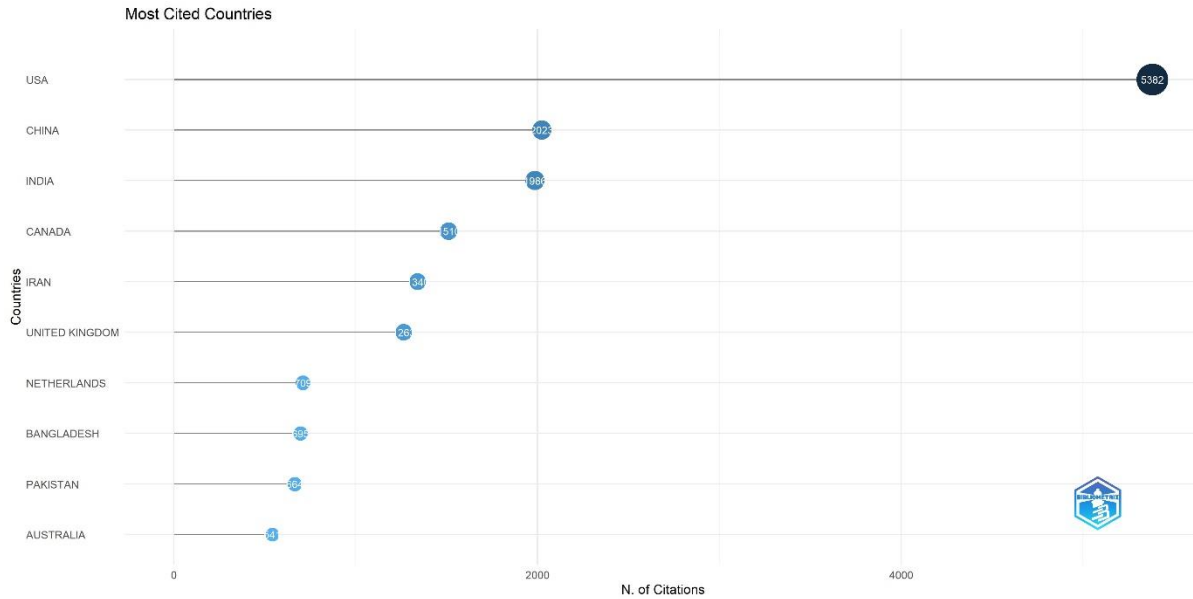


Figure 3: The distribution of countries with the highest number of citations in publications.

Table 1 demonstrates the most influential countries according to the total citation and average citation scores. The top five most influential countries have shifted based on the average citation score. Canada showed the highest average citation score of 65.7, making it the most influential country, followed by the Netherlands, United States, Bangladesh, and United Kingdom. Both the United States and United Kingdom maintained their positions in the top five most influential countries. China, India, Iran, Pakistan, and Australia were among the top ten most influential countries.

Table 1: The most influential countries according to the total citation and average citation scores.

Country	Total Citation	Average Article Citations
Canada	1510	65.70
Netherlands	709	50.60
USA	5382	29.20
Bangladesh	695	19.90
United Kingdom	1263	19.40
India	1986	17.30
Pakistan	664	16.60
Iran	1340	16.00
Australia	541	12.90
China	2023	11.80

Note: Average citation score is the ratio of total citations by a country over its total number of publications.

Figure 4 illustrates the affiliation of institutions associated with the research papers included in the analysis. It is crucial to understand the contributions and relationships of authors within the studied field, as well as emphasising any significant institutional connections. The top three most relevant affiliations were Beijing University of Chinese Medicine, Tehran University of Medical Sciences, and Shanghai University of Traditional Chinese Medicine, with a total 77, 66, and 63 affiliated articles, respectively. University of Malaya in Malaysia was ranked among the top five most influential affiliations with 46 publications (C. xiao Liu, 2021; Mehrolhassani et al., 2024).

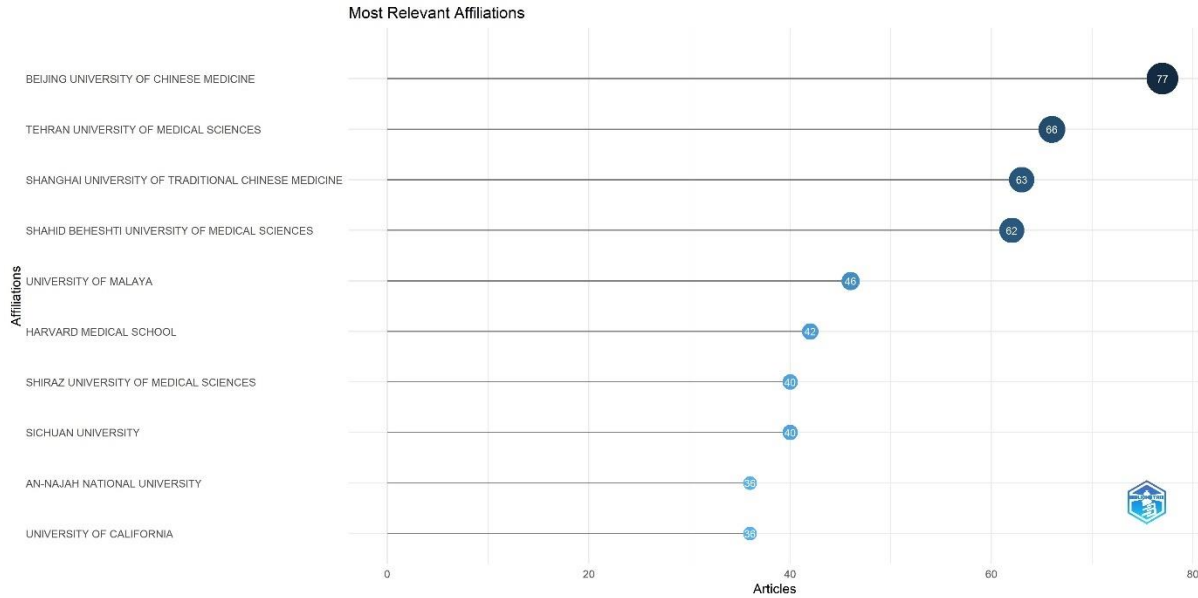


Figure 4: The most influential affiliations/institutions based on the number of publications.

Most Influential Journals and Authors

Various stakeholders in the field of integrative medicine, such as regulatory bodies, academic institutions, and researchers, among others, can benefit from the identification of the most influential journals and the most productive and influential authors. They facilitate potential future publications in the most pertinent and influential journals by assisting in the anticipation of the collaboration networks of prospective authors.

Table 2 displays the top 10 relevant sources, measured by the number of articles published in various journals related to the field of integrative medicine. Collectively, a total of 234 articles (16%) out of 1466 publications contributed to the field of integrative medicine. Among these, the *Evidence-Based Complementary and Alternative Medicine* emerged as the leading contributors, publishing 35 articles, which accounted for 2.4% of the total publications during the study period. This indicates that this journal served as the primary platform for scholarly contributions related to integrative medicine, encompassing several domains such as traditional Eastern and Western medicine, nutrition therapy, massage, mindfulness, yoga, and others. *Frontiers in Pharmacology* (32 articles), *BMJ Open* (29 articles), *Journal of Religion and Health* (29 articles) and *BMC Complementary Medicine and Therapies* (27 articles) were among the top journals with a high number of published articles. Moreover, several scholarly journals including *BMC Complementary and Alternative Medicine*, *Phytomedicine*, *European Journal of Integrative Medicine*, *African Journal of Traditional, Complementary and Alternative Medicines*, and *International Journal of Environmental Research and Public Health* had made significant contributions in the field of integrative medicine.

Meanwhile, analysis based on the number of citations revealed that the *Medical Physics* journal, which focused on biochemistry, genetics and molecular biology, medicine, radiology, nuclear medicine, and imaging had the highest number of citations with 1207 over 11 articles. Furthermore, the *BMC Complementary and Alternative Medicine* ranked second in the ranking of relevant sources with 536 citations (11 articles). The *American Journal of Tropical Medicine and Hygiene* journal, which focused on immunology, microbiology, and infectious diseases, was ranked third with 352 citations for its eight articles. The *European Journal of Integrative Medicine*, which focused on the complementary and alternative medicine, was ranked tenth in this study.

Table 2: The most relevant journals according to the number of articles, number of citations and average citation score.

Rank ^a	Sources (years covered in Scopus)	No. of Articles	Citations	Average citation
1	Evidence-Based Complementary and Alternative Medicine (all fields of integrative medicine such as traditional Eastern and Western medicine, nutrition therapy, massage, mindfulness, yoga, etc.) (1999-2017)	35	518	14.80
2	Frontiers in Pharmacology (pharmacology and toxicology) (2011-2023)	32	405	12.66
3	BMJ Open (clinical medicine, public health and epidemiology) (2012-2022)	29	110	3.79
4	Journal of Religion and Health (religious studies such as spirituality, medicine and nursing) (1999-2023)	29	349	12.03
5	BMC Complementary Medicine and Therapies (Complementary and Alternative Medicine) (2001-2023)	27	93	3.44
6	BMC Complementary and Alternative Medicine (Complementary and Alternative Medicine) (2002-2018)	20	727	36.35
7	Phytomedicine (Biochemistry, Genetics and Molecular Biology, Complementary and Alternative Medicine, Pharmacology, Toxicology and Pharmaceutics) (1999-2023)	18	554	30.78
8	European Journal of Integrative Medicine (Complementary and Alternative Medicine) (2009-2023)	16	266	16.63
9	African Journal of Traditional, Complementary and Alternative Medicines (Complementary and Alternative Medicine, Pharmacology, Toxicology and Pharmaceutics) (2006-2018)	14	507	36.21
10	International Journal of Environmental Research and Public Health (Health, Toxicology and Mutagenesis, pollution, Public Health, Environmental and Occupational Health) (2004-2022)	14	138	9.86
Rank ^b	Sources	No. of Articles	Citations	Average citation
1	Medical Physics (Biochemistry, Genetics and Molecular Biology, medicine, Radiology, Nuclear Medicine and Imaging) (1999-2023)	11	1207	109.73
2	BMC Complementary and Alternative Medicine (2001-2023)	20	727	36.35
3	Phytomedicine (1999-2023)	18	554	30.78
4	Asian Pacific Journal of Tropical Disease (Infectious Diseases, Microbiology) (2011-2020)	11	536	48.73
5	Evidence-Based Complementary and Alternative Medicine (1999-2017)	35	518	14.80
6	African Journal of Traditional, Complementary and Alternative Medicines (2006-2018)	14	507	36.21
7	Frontiers in Pharmacology (2011-2023)	32	405	12.66
8	American Journal of Tropical Medicine and Hygiene (Immunology and Microbiology, infectious diseases) (1999-2023)	8	352	44.00
9	Journal of Religion and Health (1999-2023)	29	349	12.03
10	European Journal of Integrative Medicine (2009-2023)	16	266	16.63

Note: The rankings of the journals are determined by the number of publications (rank^a), and the number of citations (rank^b).

As illustrated in Figure 5, Bradford's Law classified primary sources according to the frequency distribution of articles. The journal of *Evidence-Based Complementary and Alternative Medicine* was ranked first, with a frequency of 35 articles. It covered all areas of integrative medicine, including traditional Eastern and Western medicine, nutrition therapy, massage, mindfulness, yoga, and many others. *Frontiers in Pharmacology* was ranked second with a frequency of 32 articles, emphasising on pharmacology and toxicology. There was a total of 764 journals represented in the Bradford's Law.

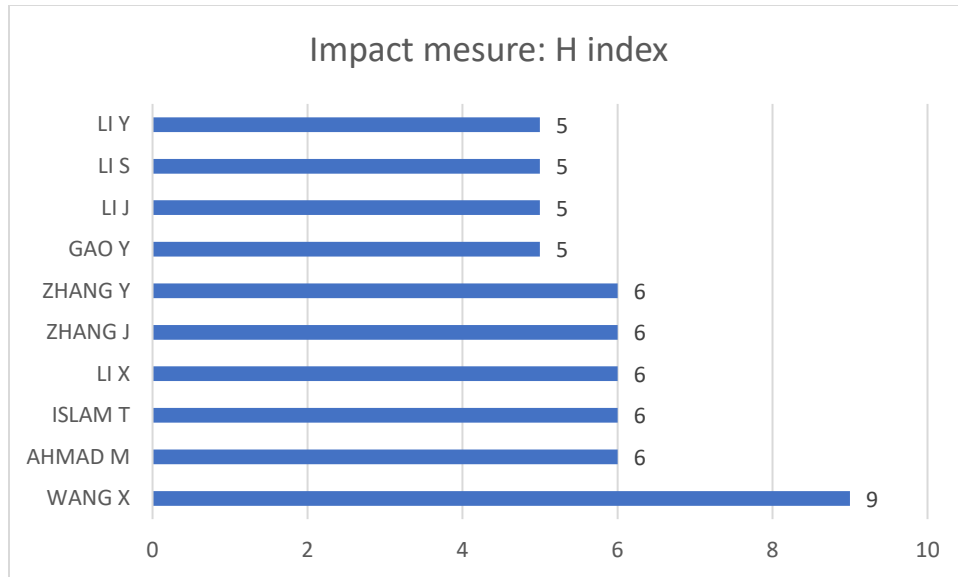


Figure 7: The most impactful authors measured by H-index.

Most Influential Articles

Researchers can develop an in-depth understanding of the progression, trajectory, and scope of research coverage documented in scientific literature by carefully analysing significant and influential papers across various domains. Table 3 displays the top ten most influential articles in integrative medicine, determined by the highest number of global citations. Raghu G (2011) ranked in the top 10 with 5756 global citations, followed by O'Donnell MJ (2016) with 1254 total global citations. Chen D (2011) ranked third with a total of 614 total citations. The top three articles aimed to: (1) document evidence-based guidelines on the diagnosis and management of idiopathic pulmonary fibrosis, (2) determine the importance of modifiable risk factors for stroke and pathological subtypes of stroke in different regions across the globe, and (3) determine Bortezomib as the first Proteasome Inhibitor anticancer drug. Most of the research outcomes were not related to integrative medicine, perhaps due to the usage of terms such as “natural” and “alternative” in the keywords search statement. Only two articles were relevant to integrative medicine, mainly Izquierdo M (2021) which aimed to determine guidelines for exercise recommendations in older adults, and Joseph B (2013), which focused on measuring the antidiabetic effects of *Momordica charantia* (bitter melon).

Table 3: The most influential articles in integrative medicine according to the highest number of global citations.

No	Author (s) and Year	Title and Journal	Global Citation
1	Raghu G (2011), Am J Respir Crit Care Med	An Official ATS/ERS/JRS/ALAT Statement: Idiopathic Pulmonary Fibrosis: Evidence-based Guidelines for Diagnosis and Management, “ <i>American Journal of Respiratory and Critical Care Medicine</i> ”	5756
2	O'donnell Mj (2016), Lancet	Global and regional effects of potentially modifiable risk factors associated with acute stroke in 32 countries (INTERSTROKE): a case-control study, “ <i>Lancet</i> ”	1254
3	Chen D (2011), Curr Cancer Drug Targets	Bortezomib as the First Proteasome Inhibitor Anticancer Drug: Current Status and Future Perspectives, “ <i>Current Cancer Drug Targets</i> ”	614
4	Sonke J-J (2005), Med Phys	Respiratory correlated cone beam CT, “ <i>Medical Physics</i> ”	590
5	Good Bj (1977), Cult Med Psych	The heart of what's the matter the semantics of illness in Iran, “ <i>Culture, Medicine and Psychiatry</i> ”	446
6	Low Da (2003), Med Phys	A method for the reconstruction of four-dimensional synchronized CT scans acquired during free breathing, “ <i>Medical Physics</i> ”	422
7	Mack Cl (2020), Hepatology	Diagnosis and Management of Autoimmune Hepatitis in Adults and Children: 2019 Practice Guidance and Guidelines from the American Association for the Study of Liver Diseases, “ <i>Hepatology</i> ”	399

8	Baugh Rf (2013), Otolaryngol Head Neck Surg	Clinical Practice Guideline: Bell's Palsy, "Otolaryngology–Head and Neck Surgery"	386
9	Izquierdo M (2021), J Nutr Health Aging	International Exercise Recommendations in Older Adults (ICFSR): Expert Consensus Guidelines, "The Journal of nutrition, health and aging"	315
10	Joseph B (2013), Asian Pac J Trop Dis	Antidiabetic effects of <i>Momordica charantia</i> (bitter melon) and its medicinal potency, "Asian Pacific Journal of Tropical Disease"	299

Table 4 presents the articles with the highest number of citations locally. Krousel-Wood MA (2010) had the highest number of local citations (16), followed by Zulkipli AF (2018) with 7 total local citations. Bahmani M (2014) ranked third with a total of 6 local citations. The majority of the articles were relevant to integrative medicine, aimed to measure the effects of complementary and alternative medicine among antihypertensive patients (Krousel-Wood MA, 2010), CAM in breast cancer patients (Zulkipli AF, 2018), and antiparasitic herbs (Bahmani M, 2014).

Table 4: The articles with the highest number of local citations.

No	Author (s) and Year	Title and Journal	Local Citation	Global citation
1	Krousel-Wood Ma (2010), J Am Geriatr Soc	Adverse Effects of Complementary and Alternative Medicine on Antihypertensive Medication Adherence: Findings from the Cohort Study of Medication Adherence Among Older Adults, "Journal of the American Geriatrics Society"	16	69
2	Zulkipli Af (2018), Integr Cancer Ther	Use of Complementary and Alternative Medicine Among Newly Diagnosed Breast Cancer Patients in Malaysia: An Early Report from the MyBCC Study, "Integrative Cancer Therapies"	7	22
3	Bahmani M (2014), Asian Pac J Trop Dis	Antiparasitic herbs used in west regions of Ilam province located in west of Iran, "Asian Pacific Journal of Tropical Disease"	6	11
4	Jazieh Ar (2012), J Altern Complement Med	Use of Complementary and Alternative Medicine by Patients with Cancer in Saudi Arabia, "Journal of Alternative and Complementary Medicine"	5	69
5	Balkrishna A (2021), J Herbal Med	Comparative retrospective open-label study of ayurvedic medicines and their combination with allopathic drugs on asymptomatic and mildly-symptomatic COVID-19 patients, "Journal of Herbal Medicine"	4	13
6	Ashraf M (2019), BMC Complement Altern Med	A cross-sectional assessment of knowledge, attitudes and self-perceived effectiveness of complementary and alternative medicine among pharmacy and non-pharmacy university students, "BMC Complementary Medicine and Therapies"	4	22
7	Tick H (2018), Explor	Evidence-Based Nonpharmacologic Strategies for Comprehensive Pain Care: The Consortium Pain Task Force White Paper, "Explore"	4	199
8	Bano A (2014), J Ethnobiology Ethnomedicine	Quantitative ethnomedicinal study of plants used in the Skardu valley at high altitude of Karakoram-Himalayan range, Pakistan, "Journal of Ethnobiology and Ethnomedicine"	4	165
9	Low Da (2003), Med Phys	A method for the reconstruction of four-dimensional synchronized CT scans acquired during free breathing, "Medical Physics"	4	422
10	Kretchy Ia (2021), Preventive Med Reports	Utilization of complementary and alternative medicine for the prevention of COVID-19 infection in Ghana: A national cross-sectional online survey, "Preventive Medicine Reports"	3	18

Table 5 presents the most recent publications related to integrative medicine, ranked by the total number of citations. The aim was to identify emerging themes or innovative research directions. These recent publications indicate continuous interest and innovative approaches to integrative medicine research, focusing on the discovery and validation of traditional and natural treatments for a wide range of health issues. Moreover, these studies investigate the potential of natural compounds and traditional medical practices in managing and treating conditions such as ocular diseases, COVID-19, inflammatory disorders, and digestive tract diseases. These publications reflect a growing interest in integrating modern scientific approaches with traditional healing techniques to enhance therapeutic outcomes and develop new treatment strategies.

Table 5: Recent publications on integrative medicine based on the total number citations.

First Author, Year, Journal	Title	Author keywords	Cited by
Stapleton F (2023), Ocular Surface	TFOS lifestyle: Impact of societal challenges on the ocular surface	Autoimmune disease; Biology; Dry eye; Employment; Infection; Inflammation; Lifestyle; Socioeconomic factors; Systematic review; Trauma	12
Gomes JAP (2023), Ocular Surface	TFOS Lifestyle: Impact of elective medications and procedures on the ocular surface	Conjunctiva; Cornea; Cosmetic surgery; Drug-related adverse reactions; Eyelids; Ocular surface disease; Oculoplastic surgery; Quality of life; Refractive surgery; Systematic review	10
Di Pierro F (2023), Frontiers in Pharmacology	Quercetin as a possible complementary agent for early-stage COVID-19: Concluding results of a randomized clinical trial	3CL protease inhibition; COVID-19; Natural Polyphenols; Phytosome[®]; Quercetin; SARS-CoV-2	9
Yu T Y (2023), Frontiers in Pharmacology	Gallic acid ameliorates dextran sulfate sodium-induced ulcerative colitis in mice via inhibiting NLRP3 inflammasome	dextran sulfate sodium; Gallic acid; NLRP3; Qingchang Suppository; ulcerative colitis	8
Khan A (2023), Computers in Biology and Medicine	Structure-based design of promising natural products to inhibit thymidylate kinase from Monkeypox virus and validation using free energy calculations	Binding free energy; Bioactivity; Drugs; Molecular screening; Monkeypox; TMPK	8
Wu W (2023), Phytomedicine	Dendrobium as a new natural source of bioactive for the prevention and treatment of digestive tract diseases: A comprehensive review with future perspectives	Dendrobium; Digestive tract diseases; Inflammation; Polysaccharide	7
Eawsakul K (2023), BMC Complementary Medicine and Therapies	Alpha-glucosidase inhibitory activities of astilbin contained in Bauhinia strychnifolia Craib. stems: an investigation by in silico and in vitro studies	Alpha-glucosidase; Antihyperglycemic effect; Astilbin; Bauhinia strychnifolia Craib	6
Lin JR (2023), Nature Cancer	High-plex immunofluorescence imaging and traditional histology of the same tissue section for discovering image-based biomarkers		6
Mueed A (2023), Frontiers in Nutrition	Extraction, characterization of polyphenols from certain medicinal plants and evaluation of their antioxidant, antitumor, antidiabetic, antimicrobial properties, and potential use in human nutrition	antidiabetic; antimicrobial; antioxidant; antitumor; human nutrition; medicinal plants; polyphenols	6
Tretter F (2023), Journal of Evaluation in Clinical Practice	Perspectives of (/memorandum for) systems thinking on COVID-19 pandemic and pathology	integrative systems pathology of Corona; methodology of systemic modelling; social ecology of pandemics; systems science and thinking	6

Bibliometric Network Map Analysis (BNA)

At present, traditional and complementary medicine is gaining global recognition and popularity due to patients' increasing desire for personalised health care and greater autonomy for their health and overall well-being. Since 1976, the Traditional Medicine Unit of the WHO has been engaged in collaborative efforts with other countries to establish benchmarks and standards for the implementation of diverse traditional medicine systems, and integrating them into the International Classification of Diseases (ICD) using empirical evidence. The expansion of integrative medicine has increased by fivefold in the past decade due to multiple global initiatives, including those by the WHO, the establishment of safety guidelines, and the construction of framework. Thus, the number of publications in integrative medicine started to grow exponentially in 2017 and

reached its highest point in 2023 with 267 publications, as depicted in Figure 8. Therefore, it is essential to analyse the intellectual structure, network of research collaborations, and conceptual structure of integrative medicine research.

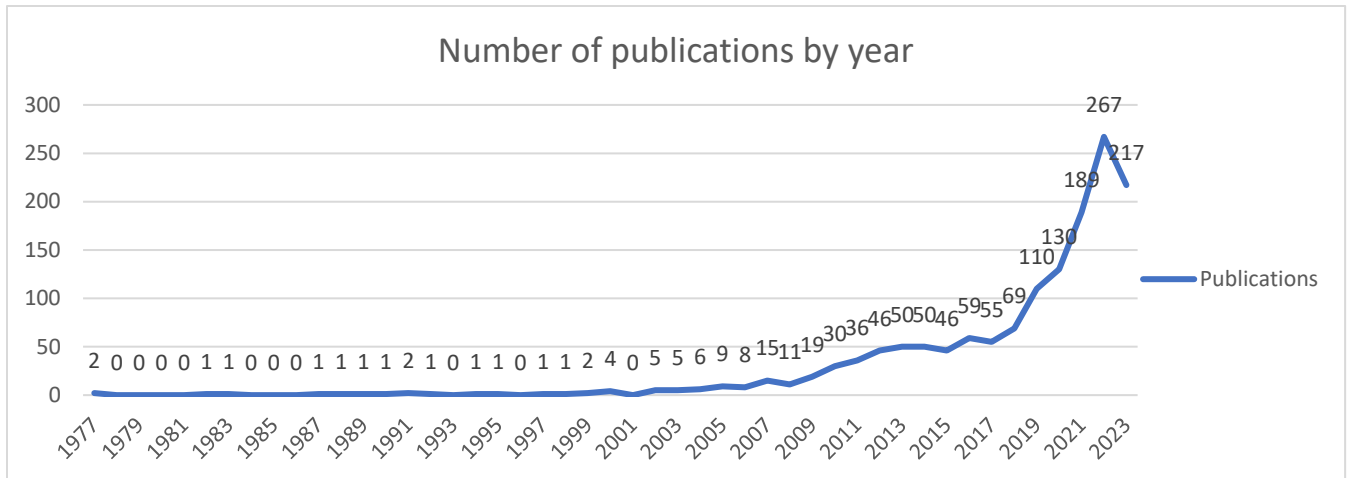


Figure 8: The growth and the number of publications related to integrative medicine by year.

Intellectual Structure (Co-Citation Analysis)

Co-citation publications involve the use of representative journals as analytical units. Co-citation analysis examines the interrelationships between journals to evaluate the citation flow between any two pairs of journals provided. In a nutshell, it is designed to identify the publications with the most co-cited content and their corresponding links. In this context, it is widely acknowledged that closer positions between journals indicate a higher degree of relatedness or co-citation relationships.

Furthermore, the presence of lines connecting journals serves as an extra measure for assessing the quality of the co-citation links. As depicted in Figure 9, the overall proximity of the three clusters suggests that journals with a minimum of 50 citations tend to cite similar references, resulting in robust co-citation links.

It is evident from the analysis of the most influential journals that the co-citation connections between transdisciplinary medical journals, such as *Plos One*, *Nature*, *Gastroenterology*, and *Hepatology*, are comparatively stronger than those of mainstream complementary medicine journals such as *Lancet*, *BMJ Open*, and *Journal of Alternative Complementary Medicine*.

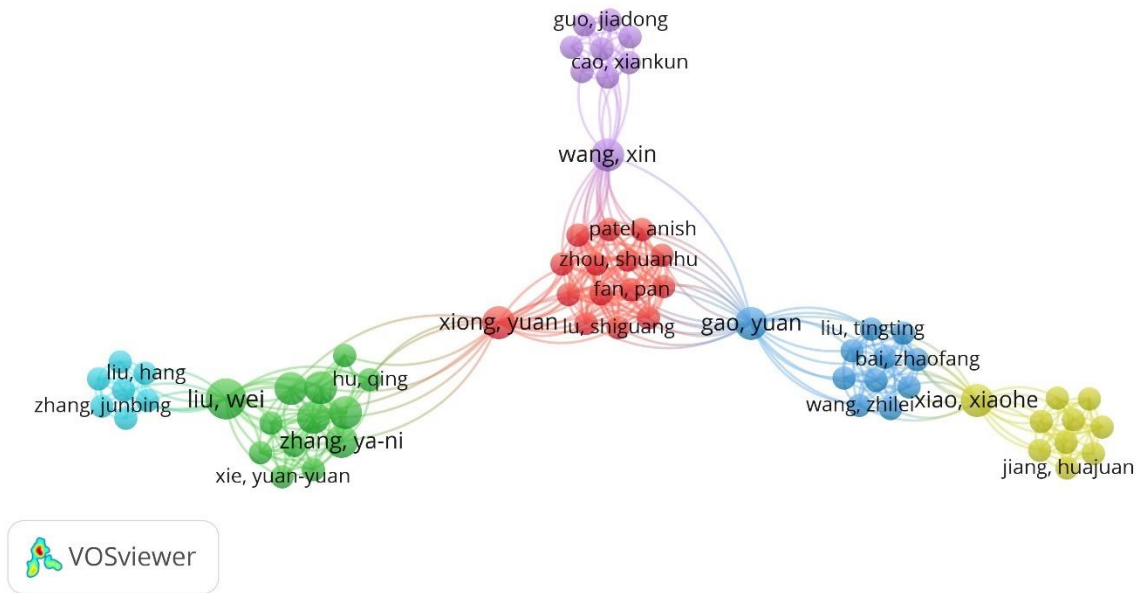


Figure 10: Social network of research collaboration via co-authorship analysis.

Conceptual Structure of Integrative Medicine Literature

Bibliometric Coupling

The level of connection between publications was measured using bibliographic coupling, which was determined by the number of common references, as depicted in Figure 11 and Appendix A. By applying this principle to the entire collection of publications, research clusters were generated, which may influence the thematic or conceptual framework of the specific subject area. In this phase, the selection of final bibliometric coupling only focused on human studies, while animal studies, in vivo and in vitro studies were excluded. This finding indicates that the publications are delving into a comparable subject matter.

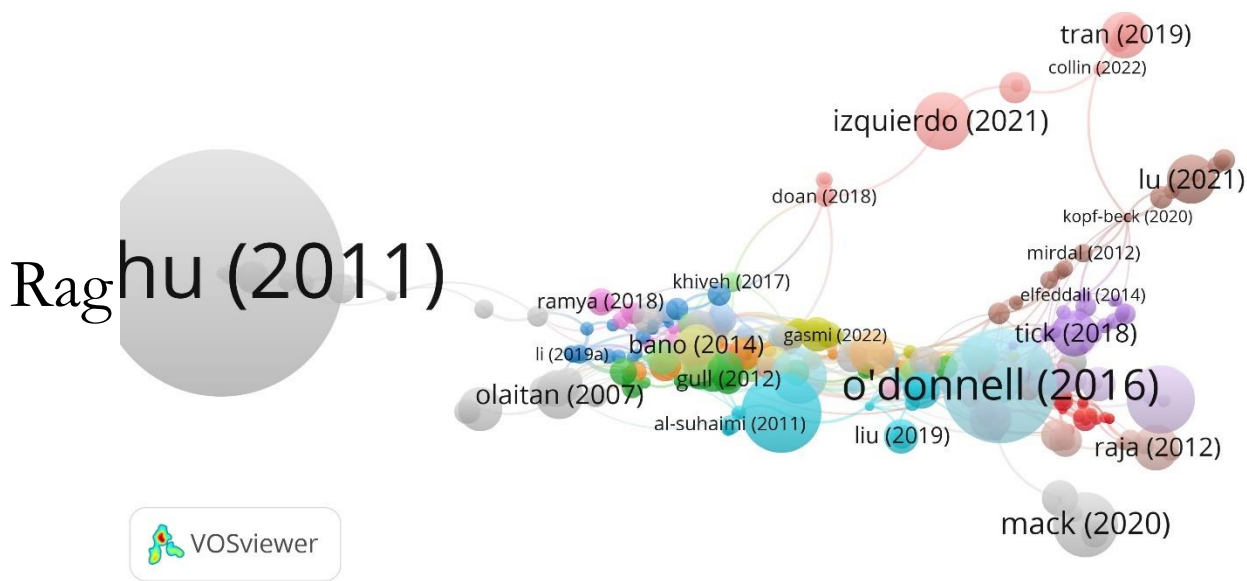


Figure 11: Bibliographic coupling network.

Note: "Document" was chosen as the unit of analysis, and "fractional count" was chosen as the method of analysis. The fractional count method of analysis aimed to reduce the impact of publications containing many authors. A minimum of ten citations was established for each document. As a result, 568 documents out of 1466 met the threshold. Of that, the largest set of connected coupling contained 371 items with 27 clusters.

Title and Abstract Map Analysis

The textual data extracted from publication titles and abstracts contributed to the construction of keyword co-occurrence maps. In this regard, keyword networks may aid researchers in identifying the relevant variables associated with their field of study. Additionally, the clusters of keywords illustrated in the network map, as shown in Figure 12 and Table 6 might enhance the authors' understanding of potential keyword combinations that could be utilised to generate relevant research topics.

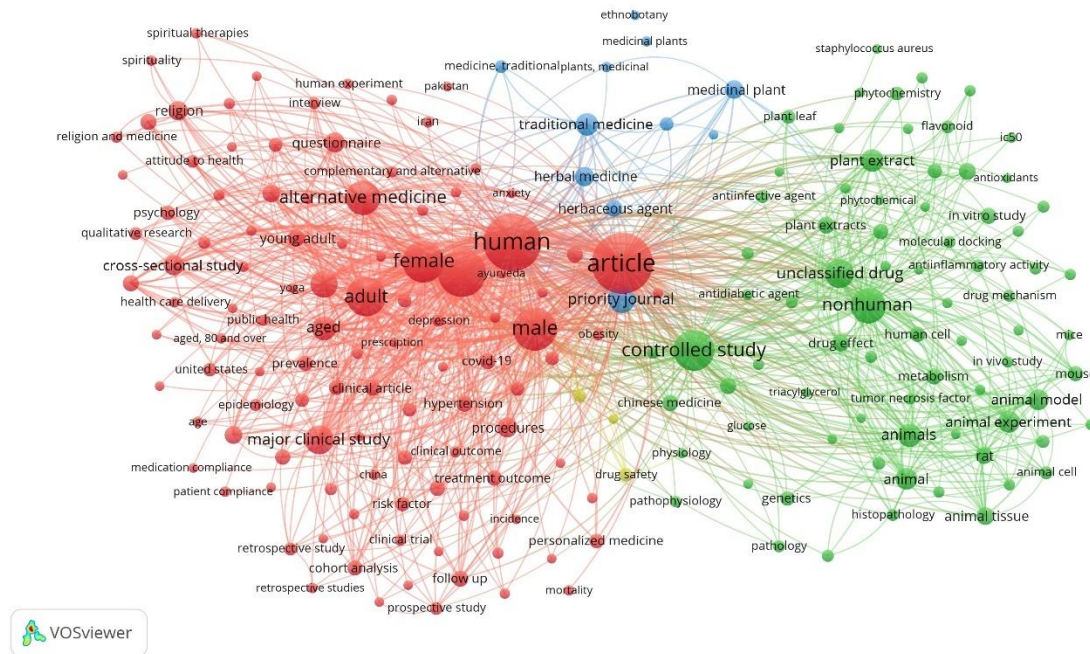


Figure 12: Title and abstract map analysis.

Note: The minimum number of occurrences of a term was set at 30 times with complete count method. As a result, out of 13856 keywords, 201 met the threshold.

Table 6: Title and abstract map analysis.

Cluster	Most relevant keywords	Occurrences	Links	Total link strength
1	Acupuncture	60	143	864
1	Adult	479	197	7206
1	Alternative medicine	373	199	4968
1	Article	1159	200	14464
1	Ayurveda	30	127	427
1	Complementary and alternative medicine	41	132	528
1	Complementary medicine	31	126	438
1	Complementary therapies	98	157	1507
1	Female	555	200	8177
1	Human	1058	200	12555
1	Integrative medicine	63	156	765
1	Religion	118	136	1372
2	Chinese medicine	85	180	1222
2	Controlled study	534	200	7971
2	Natural product	49	159	684
2	Non-human	389	192	5323
2	Plant extract	167	178	2675
2	Plant extracts	90	163	1548
2	Plant leaf	60	142	933
3	Ethnobotany	30	98	398
3	Herbaceous agent	96	189	1445
3	Herbal medicine	116	191	1679
3	Medical plant	113	169	1647
3	Medicine, traditional	57	153	847
3	Plant medicinal product	30	122	481
3	Plant, medicinal	35	128	569
3	Traditional medicine	165	194	2259
4	Comparative study	57	168	774
4	Drug safety	59	168	883

Thematic Map Analysis

Thematic map analysis determined the progress of research clusters through the construction of strategic networks, based on the keyword co-occurrence analysis. Figure 13 demonstrates two distinct typologies based on the concentration of research, particularly on themes or categories, namely human and non-human studies, which encompassed animal, in vitro and in vivo studies. As shown in Figure 14, the right side represents non-human studies, while the left side represents human studies.

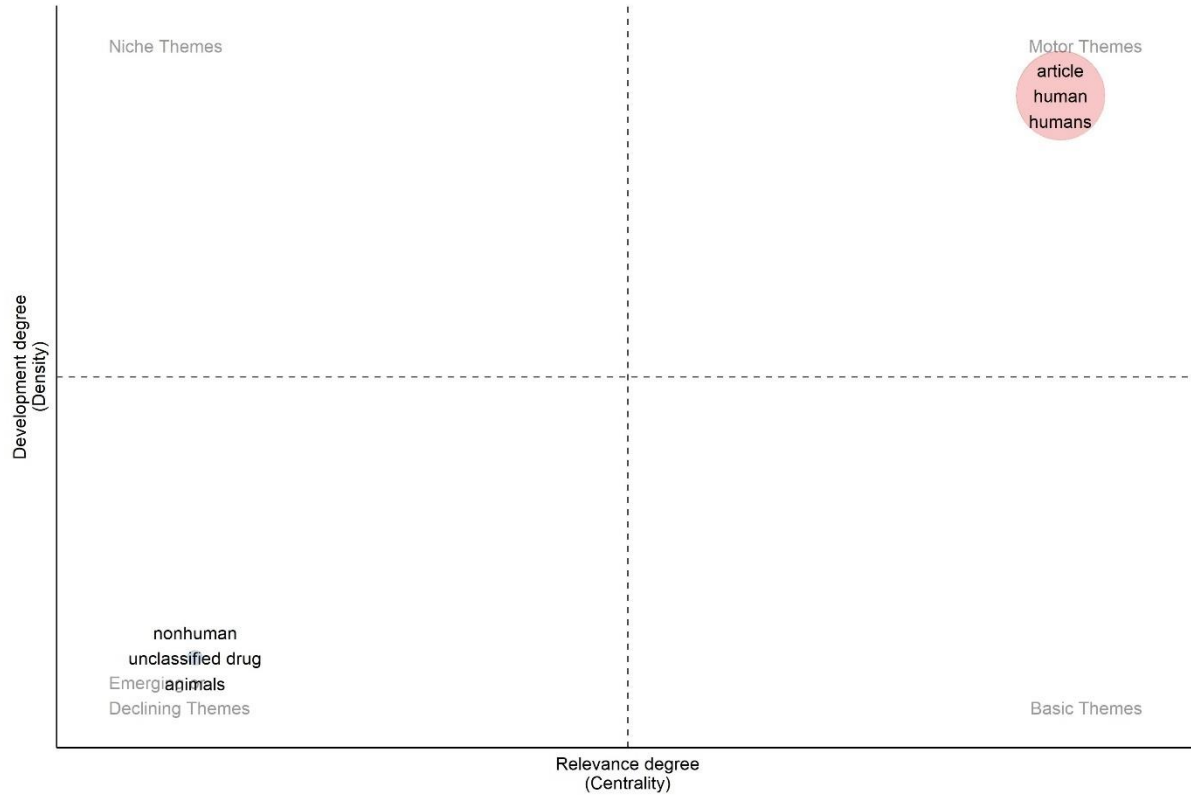


Figure 13 Thematic map analysis of integrative medicine literature.

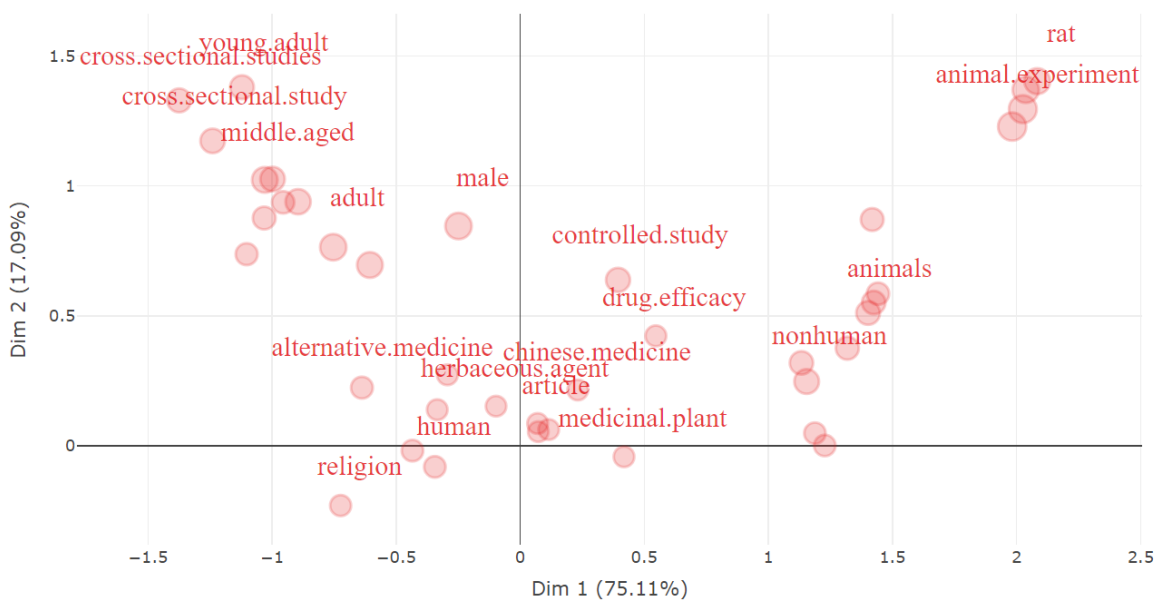


Figure 14: Thematic map analysis.

Content Analysis

Bibliometric coupling resulted in 27 clusters. The content analysis discussed in this section concentrated on the specific clusters identified in the data.

Herbal Remedies for Hypertension

A study conducted by Hughes et al. (2013) revealed that 21% of hypertensives in South Africa utilised traditional herbal medication to treat their hypertension. The majority of these users were women (82.1%), and they commonly used the drug in combination with tea or other mixes (63%). In Bangladesh, traditional healers and herbalists, were extensively utilised by older women living in rural areas, as they believed in the effectiveness of these interventions (Hossen & Westhues, 2012). A previous study from Qatar identified certain plants, and spices that effectively helped in regulating hypertension, namely *Acorus calamus* (Sweet Flag or Calamus), *Agelanthus dodoneifolius* (Mistletoe), *Allium cepa* (Onion), *Alpinia zerumbet* (Shel Ginger), *Apocynum venetum* (Dogbane or Indian Hemp), *Arctium Lappa* (Burdock), *Avena sativa* (Common Oat), *Carthamus tinctorius* L. (Safflower), *Cassia occidentalis* (Reclassified as Senna Occidentalis) (Coffee Weed), *Cinnamomum zeylanicum* (Cinnamon), *Cirsium japonicum* (Japanese Thistle), *Coleus forskohlii* (Makandi), *Cynanchum wilfordii* (Dog-strangling Vine), *Echinodorus grandiflorus* (Burhead), *Elettaria cardamomum* (Cardamom), *Embelia ribes*, *Gastrodia elata* Blume (Tianma), *Gentiana floribunda*, *Gossypium barbadense* (Pima Cotton), *Gynura procumbens* (Pointed Phoenix Tail), *Kaempferia parviflora* (Thai or Black Ginseng), *Lavandula stoechas* (Lavender), and many more (Anwar et al., 2016). A randomised, multicenter, double-blind noninferiority trial conducted in China found that the Chinese herbal formula, Songling Xuemaikang capsule demonstrated substantial reductions in total hypertension symptom and total cholesterol level (Lai et al., 2022).

Medicinal plants in multiple tribal groups, Bangladesh

Approximately, 2% of the total population in Bangladesh is comprised of twenty tribes that reside within the nation's borders. These tribes have their own tribal practitioners that used plant remedies to treat illnesses (Rahmatullah et al., 2011). The majority of rural population in Bangladesh lived in poverty and they worked as day labourers for low wages. Therefore, herbal or plant products are widely used since they are readily available. For example, the Santal tribes used various herbs for medicinal purposes, such as *Justicia adhatoda* (Malabar nut) as a remedy for asthma; *Benincasa hispida* (wax gourd) to treat colic discomfort and flatulence related to ulcers, *Streblus asper* for the treatment of abscesses, *Vanda tessellate* (orchid) for rheumatic pain, and *Premna integrifolia* (Verbenaceae) for snake bites (Rahmatullah et al., 2012).

A previous study by Kesharwani et al. (2019) stated that herbal medicine offers numerous advantages, including cost-effectiveness, patient toleration, widespread availability, safety, effectiveness, potency, recyclability, and environmental friendliness. A variety of natural extracts such as hypericin, artemisinin, morphine, reserpine, and curcumin, have been utilised for a long time to treat various tropical diseases. However, there are certain issues related to tropical medicines such as policy implementation, effectiveness, resistance and toxicity.

A study by Rahmatullah et al., (2012) discovered twelve medicinal plants utilised by tribal practitioners of the Marakh sect of the Garos, Bangladesh for the treatment of diabetes. The plants mentioned in the study include *Coccinia grandis*, *Momordica charantia*, *Cuscuta reflexa*, *Phyllanthus emblica*, *Alstonia scholaris*, *Catharanthus roseus*, *Enhydra fluctuans*, *Terminalia chebula*, *Syzygium aqueum*, *Drynaria quercifolia*, and *Clerodendrum viscosum*. Scientific findings revealed that nearly all plants utilised by the tribal practitioners of the Garo have documented antidiabetic or antioxidant properties. Therefore, these plants exhibit great potential for future effectiveness of antidiabetic medications study.

Complementary & alternative medicine for COVID-19

A comparative retrospective open-label study was conducted to assess the therapeutic efficacy of Ayurvedic medicine, comprising natural sources and plants, in contrast to allopathic medicine, which included antihistamines, azithromycin, and acetaminophen, in the treatment of COVID-19. The findings revealed that 83.3% of patients who received Ayurvedic treatment experienced symptomatic relief with no adverse effects,

in comparison to the allopathic group (48.78%) (Balkrishna et al., 2021). In another placebo controlled randomised double-blind pilot clinical trial, 71.1% of patients in the Ayurvedic group had recovered by day three with 100% recovery rate by day seven, compared to the placebo group with 50% and 60% recovery rates by day three and day seven, respectively (Devpura et al., 2021).

Based on the terms' relative search volumes (RSVs), it was also determined that during the COVID-19 pandemic, people in the USA and the UK were interested in certain foods, herbs, and supplements. These included black seed, vitamin C, zinc, and quercetin (Günalan et al., 2021). In Ghana, approximately 82.5% (986/1195) of the participants utilised CAM during the COVID-19 pandemic, 69.1% (681/986) of this population used it to prevent COVID-19 infection. The primary CAM therapies used included vitamin supplements (88.1%), spiritual healing/prayer (23.3%), mineral supplements (22.3%), herbal remedies (22.2%), and diet therapy (19.4%).

In China, more than 30 traditional Chinese medicine formulas containing 76 medicinal herbs were used to treat COVID-19. The herbs include *Glycyrrhiza*, *Scutellaria baicalensis*, *Rhizoma Zingiberis Recens*, *Paeonia lactiflora* root, *Ziziphus jujube*, *Pinelliae Rhizoma Praeparatum Cum Zingibere*, *Ephedra sinensis*, *Ramulus Cinnamomi*, *Semen Armeniacae Amarum*, *Ginseng*, *Bupleurum chinense*, *Gypsum fibrosum* (*Sheng Shi Gao*), *Platycodon grandiflorus*, and *Magnolia officinalis* (Lee et al., 2021). Nevertheless, some authors argued that some plant extracts could exacerbate the symptoms of COVID-19, such as *Glycyrrhiza glabra* extracts, which may cause pulmonary hypertension (Gasmi et al., 2011). *Echinacea purpurea* (purple coneflower), *Astragalus* (milkvetch), *Pelargonium sidoides* (African geranium), *curcumin*, *propolis*, *Glycyrrhiza glabra* (licorice) root, and *glycyrrhizin* were among the herbs that have been criticised for their possible toxicity. Additional investigation is required to elucidate these compounds. Further research is needed to clarify these compounds.

Non-pharmacological Therapy/ Mindfulness

In America, white paper has been established in developing non-pharmacological strategies for comprehensive pain care. These strategies include massage therapy, acupuncture therapy, osteopathic and chiropractic manipulation, meditative movement therapies such as Tai chi and yoga, dietary components, mind body behavioral interventions, and strategies for self-care (Tick et al., 2018; Williams et al., 2020). Moreover, dietary components such as fruits, vegetables, legumes, nuts, whole grains, and seeds that are low in animal protein but high in healthy oils which are considered anti-inflammatory were used. Other herbs include curcumin, ginger, and turmeric. Furthermore, according to the results of exploratory randomised clinical trial, simple meditation and music listening may be effective in reducing pain, decreasing tension, and improving mood, sleep, and quality of life in adults with knee osteoarthritis (Innes et al., 2018).

Meanwhile, complementary health approaches incorporated relaxation techniques, massage, mind-body techniques, chiropractic/osteopathic manipulation, multivitamin and botanical remedies, among other modalities, for cardiovascular disease patients (Sirois et al., 2018).

Complementary & Alternative Medicine for Cancer

The integration of CAM in supportive care in oncology has been practiced worldwide. In the Middle East, the examples of CAM modalities used in cancer care include dietary and nutritional therapies, herbal medicine, acupuncture, anthroposophical medicine, homeopathy, mind-body medicine, shiatsu, therapeutic touch, and yoga (Ben-Arye et al., 2012). In China, TCM therapy has been shown to improve the 5-year survival rate in patients with hepatocellular carcinoma (Liu et al., 2019). In Turkey, 46.4% cancer patients utilised CAM, with the majority of them used herbal products such as propolis, stinging nettle tea, black cumin, mushroom, and centaury oil (Irmak et al., 2019). In Saudi Arabia, 88% of patients utilised religious practices as remedies such as Quran recitation (74.8%), prayer (16%), and others. On the other hand, 85.2% of patients used dietary supplements such as honey, black seed, Zamzam water, water with Quranic recitation, and additional remedies (Akhu-Zaheya & Alkhasawneh, 2012; Jazieh et al., 2012). In Malaysia, Islamic medical practices and dietary supplements were the most common forms of CAM, followed by traditional Malay medicine (e.g., Malay herbs, Malay massage, cupping), traditional Chinese medicine (e.g., Chinese herbs, acupuncture and moxibustion,

qigong, tuina), traditional Indian medicine (e.g., Siddha, yoga), manipulative based therapy (nutritional therapy, minerals, naturopathy), and homeopathy (Hamed Abdalla et al., 2020).

According to a systematic review conducted by Keene et al. (2019), Malaysia reported the highest mean prevalence of CAM usage among cancer patients (61.9%), followed by Australia (56.6%), Germany (41.1%) and Turkey (39.9%). Among all the research conducted, female gender was identified as a predictor of CAM usage in cancer patients, which explained why the term "female" appeared in the top five most commonly used keywords.

Ritual Healing

There has been growing medical research inclined towards the potential health benefits associated with Muslim religious practices. Dhikr (chanting) and salat (prayer) are fundamental elements of Muslim religious observance. According to a review by Saniotis (2018), these two religious traditions integrate elements of mind-body medicine due to their beneficial impact on the psychoneuroimmunological response. Ritual healing has also been practiced in India, particularly for patients with mental health conditions (Ranganathan, 2015; Sax, 2014). Similarly in Mexico, Mestizo spirituality has been utilised in psychotherapeutic approach (Cervantes, 2010). Meanwhile in China, a randomised clinical trial of electroacupuncture treatment for insomnia in patients with depression revealed that sleep quality substantially improved in the electroacupuncture group compared to those in the control group. The improvement was observed at week 8 and remained stable at week 32 (Yin et al., 2022).

Cupping Therapy

Cupping therapy has demonstrated clinically significant improvement in the treatment of patients with persistent non-specific low back pain (Farhadi et al., 2009). In another study, cupping was found to enhance arterial oxygen saturation level in smokers, lower systolic blood pressure (Aleyeidi et al., 2015), alleviate anterior knee pain and provide positive impact on quality of life in terms of pain relief, range of motion and overall wellbeing (Sajid, 2016). However, one article in this cluster discussed the adverse effect of CAM, associating it with low adherence to antihypertensive medication among older adults (Krousel-Wood et al., 2010).

Honey

Raw unprocessed honey from Malaysia has been identified to have higher antioxidant activity compared to Manuka honey, suggesting that it possessed significant potential for application in complementary and alternative medicine (Abu Bakar et al., 2017). In another review, clinical research has shown that the administration of honey to deeply infected cutaneous wounds expeditiously eradicate the infection and promotes tissue regeneration, exhibiting its antimicrobial property (Israili, 2014).

Complementary & Alternative Medicine for Diabetes

A study conducted among Jordanian diabetes patients revealed that the most frequently used herbal product was green tea, followed by aniseed and ginger (Wazaify et al., 2011). In Malaysia, biological therapy was the most commonly used treatment method, which accounted for 50% of cases, followed by manipulative-body based systems, energy systems, alternative medicine systems, and mind-body systems. The most commonly used herbs in biological therapy include Bitter melon (*Momordica Charantia*), Misai Kucing (*Orthosiphon Stamineus Benth*), garlic (*Allium Sativum*), and Sabah snake grass (*Clinacanthus Nutans Lindau*) (Ching et al., 2013).

Overall Trend of Integrative Medicine Based on The Publications

Recent publications indicate a prevailing tendency in integrative medicine towards the integration of conventional medicine with alternative health practices. The United States, China, and Iran have been identified as the leading influential countries and organisations in the field of integrative medicine. The United States has a significant impact on integrative medicine due to its robust research infrastructure, diverse population, and strong regulatory support, notably from the National Institutes of Health (NIH), particularly through the National Center for Complementary and Integrative Health (NCCIH) (Cody, 2018). The diversity of the United States enables for the integration of various traditional practices into conventional medicine, in response to the

demand of consumers for holistic and preventive healthcare. Nationwide educational initiatives further equip new healthcare professionals with knowledge in both conventional and complementary therapies. Moreover, collaborative networks facilitate the exchange of specialised knowledge, thereby advocating for a holistic approach on health. Collectively, these elements establish the United States as a frontrunner in the worldwide advancement of integrative medicine.

Meanwhile, China is renowned for its abundant medicinal biological resources derived from geographical and natural environments, as well as complementary medicinal resources with broader consumer markets (C. xiao Liu, 2021). Traditional Chinese Medicine (TCM) is founded on the theoretical framework of the Yin Yang theory, with an emphasis on the physiology and pathology of Zang Fu organs and meridians. In addition to its fundamental principles, the practices of syndrome differentiation and treatment are pivotal to TCM (C. xiao Liu, 2021). In Iran, traditional medicine, alternatively referred to as Persian medicine, is a millennia-old comprehensive medical tradition that aims to promote optimal health and disease prevention among individuals. Medical practitioners in Iran utilised three paradigms of treatment: lifestyle modification, utilisation of natural medicinal remedies, and application of basic therapeutic techniques such as cupping and massage (Mehroolhassani et al., 2024).

The trend of integrative medicine can be seen in recent years' publications, as indicated by the total citations. The provided document list primarily covers recent publications from 2023, exhibiting diverse research within the medical and health sciences fields, with a notable emphasis on the study of diseases and their remedies using various methods and interventions. The first highly cited publication was on the key area of ocular health. Two articles in the *Ocular Surface* journal focused on lifestyle impacts and elective medical procedures affecting the ocular surface, by addressing topics such as autoimmune diseases, inflammation, and the impact of cosmetic surgeries. Another key area of research was COVID-19, with publications in the *Frontiers in Pharmacology* journal highlighted the anti-inflammatory qualities of natural remedies and on natural compounds like quercetin and gallic acid as possible treatments for early-stage COVID-19 and ulcerative colitis. Infectious diseases also emerged as a key research area, as seen in a study on structure-based drug design against the Monkeypox virus. The potential therapeutic advantages of natural products and traditional medicine is another important research area with numerous studies examined their benefits in the treatment of a wide range of ailments, from digestive tract diseases to diabetic management. This demonstrates a growing interest in integrating natural and traditional remedies into modern medical practices, especially when COVID-19 hit us hard.

Integrating bibliometric analysis findings with an Islamic perspective allows for a unique exploration of traditional Islamic medicine and integrative healthcare techniques. The analysis's concentration on herbal cures aligns with Prophetic Medicine, which emphasises natural treatments like honey and black seed (*Nigella sativa*) as referenced in hadiths (Mogharbel et al., 2023). These remedies reflect Islamic medicine's historical continuity and holistic framework, which emphasises body-soul balance, natural, non-invasive treatments, and overall well-being.

Spiritual healing and the mind-body connection are also CAM-Islamic overlaps. Islam emphasises prayer and dhikr (remembrance of God) for spiritual and bodily healing (Sanjotis, 2018). Modern non-pharmacological therapies like mindfulness and meditation are being recognised in Western medicine for their therapeutic effects. These practices are spiritual disciplines that improve mental and physical health, showing how religious rituals are healing. The research of tribal customs in Bangladesh shows a continuity of ethnomedicine that resembles Islamic medicine. These actions uphold Islamic environmental stewardship values of sustainable resource use.

Islamic dietary regulations are important in CAM. Dietary supplements and natural therapies are selected based on halal (permissible) and tayyib (pure and wholesome) principles to enhance health in accordance with Islamic law (Alzeer et al., 2018). Both integrative medicine and Islamic teachings emphasise preventative medicine, which promotes health via nutrition, hygiene, and natural therapies. In addition, Islamic medical ethics in CAM therapies emphasises informed consent, patient autonomy, and ethical treatment. These ethical considerations are crucial in modern healthcare and profoundly ingrained in Islamic medical practices, bridging the gap between traditional and modern patient care.

In conclusion, incorporating Islamic viewpoints into integrative medicine reveals its significant cultural and spiritual contributions to modern healthcare. This holistic approach respects both the scientific and spiritual aspects of treatment, enriching the analysis and helping us comprehend how religion and medicine interact in the modern world.

CONCLUSION

This review aimed to assess the advancement in the fields of integrative medicine and CAM. The data revealed an increase in the number of publications, and this trend is anticipated to continue in the years to come. The top most influential countries according to the number of global citations include USA, China, India and Iran. The top three most cited journals include 1) *Medical Physics*, 2) *BMC Complementary and Alternative Medicine*, and 3) *Phytomedicine*. These journals provide resources related to biochemistry, genetics, molecular biology, medicine, pharmacology, toxicology, pharmaceuticals and complementary and alternative medicine. Six clusters were identified in co-citation and co-authorship analysis. Four clusters were identified in co-occurrence of keywords analysis. Through bibliographic coupling network analysis, the largest set of connected coupling contains 371 items with 27 clusters. Among those clusters were 1) herbal remedies for hypertension [affiliations: Qatar University, Qatar; Shahjalal University of Science and Technology, Bangladesh; Beijing University of Chinese Medicine, China], 2) medicinal plants in multiple tribes in Bangladesh [University of Development Alternative, Bangladesh; Islamic University, Bangladesh], 3) CAM for COVID-19 [Patanjali Research Institute, India; Institute of Pharmaceutical Biology and Phytochemistry, Germany; Bio-Organic and Natural Products Research Laboratory, United States;], 4) nonpharmacological therapies/ mindfulness [West Virginia University, United States; University of Washington, United States; University of Sheffield, Sheffield, United Kingdom; VA Puget Sound Health Care System, United States], 5) CAM for cancer [College of Medicine and Dentistry, Australia; Universiti Kebangsaan Malaysia Medical Centre, Malaysia; King Saud Bin Abdulaziz University for Health Sciences, King Abdullah International Medical Research Center, Saudi Arabia; Jordan University of Science and Technology, Jordan], 6) ritual healing [Ordnance Factory Campus, India; University of Adelaide, Australia; South Asia Institute, United States], 7) cupping therapy [Ministry of Health, Saudi Arabia; Kermanshah University of Medical Sciences, Iran; Masaryk University, Czech Republic], 8) honey [Universiti Tun Hussein Onn Malaysia (UTHM), Malaysia; Emory University School of Medicine, United States], and 9) CAM for diabetes [Université Mohammed V-Souissi, Morocco; Universiti Putra Malaysia, Malaysia; The University of Jordan, Jordan]. The research themes emerged from variations in the application of CAM/ T&CM across bodily systems or countries.

A comprehensive analysis of the most influential works and highlighting the interconnections between the publications unveiled the intellectual framework of integrative medicine and its connection to alleviate symptoms and diseases. The knowledge map is additionally generated through the visualisation of the interconnections among discrete pockets of intellectual structure. Gaining insight into the contribution of integrative medicine towards the development of comprehensive care facilitates the identification of conceptual, theoretical, and empirical evidence.

A number of actions are required to effectively implement integrative medicine into global healthcare systems. Greater funding and support should be allocated to rigorous research addressing the safety and efficacy of CAM practices in accordance with international health standards. Strict guidelines and standards must be established for T&CM procedures and the manufacturing of herbal medicines in order to guarantee public safety. Education is essential for conventional medical professionals to comprehend T&CM and for T&CM practitioners to enhance their training with modern medical knowledge, fostering collaborative methods. International collaboration in integrative medicine research and practice can lead to innovative healthcare solutions, while public education initiatives are necessary to inform the public about the benefits and limitations. Through these initiatives, integrative medicine can have a significant global health impact by providing a wide range of holistic and all-encompassing strategies for illness prevention and treatment.

Source of Funding

This study is supported by the research grant awarded to the first author; the IIIT - Strategic Research Programme 2023 (IIIT-SRP23-022-0022).

Informed Consent Statement: Not applicable.

REFERENCES

- Abu Bakar, M. F., Sanusi, S. B., Abu Bakar, F. I., Cong, O. J., & Mian, Z. (2017). Physicochemical and antioxidant potential of raw unprocessed honey from Malaysian stingless bees. *Pakistan Journal of Nutrition*, 16(11), 888–894. <https://doi.org/10.3923/pjn.2017.888.894>
- Akhu-Zaheya, L. M., & Alkhasawneh, E. M. (2012). Complementary alternative medicine use among a sample of Muslim Jordanian oncology patients. *Complementary Therapies in Clinical Practice*, 18(2), 121–126. <https://doi.org/10.1016/j.ctcp.2011.10.003>
- Al Khayat, M. H. (1997). *The Right Path to Health. Health Education through Religion. Health : An Islamic Perspective. In Right path to health. Health education through religion.* (p. 54).
- Aleyeidi, N. A., Aseri, K. S., Matbouli, S. M., Sulaiamani, A. A., & Kobeisy, S. A. (2015). Effects of wet-cupping on blood pressure in hypertensive patients: A randomized controlled trial. *Journal of Integrative Medicine*, 13(6), 391–399. [https://doi.org/10.1016/S2095-4964\(15\)60197-2](https://doi.org/10.1016/S2095-4964(15)60197-2)
- AlRawi, S. N., Khidir, A., Elnashar, M. S., Abdelrahim, H. A., Killawi, A. K., Hammoud, M. M., & Fetters, M. D. (2017). Traditional Arabic & Islamic medicine: Validation and empirical assessment of a conceptual model in Qatar. *BMC Complementary and Alternative Medicine*, 17(1), 1–10. <https://doi.org/10.1186/s12906-017-1639-x>
- Alzeer, J., Rieder, U., & Hadeed, K. A. (2018). Rational and practical aspects of Halal and Tayyib in the context of food safety. *Trends in Food Science and Technology*, 71(November), 264–267. <https://doi.org/10.1016/j.tifs.2017.10.020>
- Anwar, M. A., Al Disi, S. S., & Eid, A. H. (2016). Anti-hypertensive herbs and their mechanisms of action: Part II. *Frontiers in Pharmacology*, 6(MAR). <https://doi.org/10.3389/fphar.2016.00050>
- Attewell, G. (2006). Islamic Medicines: Perspectives on the Greek Legacy in the History of Islamic Medical Traditions in West Asia. *Medicine Across Cultures*, 325–350. https://doi.org/10.1007/0-306-48094-8_16
- Balkrishna, A., Bhatt, A. Ben, Singh, P., Haldar, S., & Varshney, A. (2021). Comparative retrospective open-label study of ayurvedic medicines and their combination with allopathic drugs on asymptomatic and mildly-symptomatic COVID-19 patients. *Journal of Herbal Medicine*, 29. <https://doi.org/10.1016/j.hermed.2021.100472>
- Ben-Arye, E., Ali-Shtayah, M. S., Nejmi, M., Schiff, E., Hassan, E., Mutafoglu, K., Afifi, F. U., Jamous, R. M., Lev, E., & Silbermman, M. (2012). Integrative oncology research in the Middle East: Weaving traditional and complementary medicine in supportive care. *Supportive Care in Cancer*, 20(3), 557–564. <https://doi.org/10.1007/s00520-011-1121-0>
- Cervantes, J. M. (2010). Mestizo spirituality: Toward an integrated approach to psychotherapy for latina/os. *Psychotherapy*, 47(4), 527–539. <https://doi.org/10.1037/a0022078>
- Ching, S. M., Zakaria, Z. A., Paimin, F., & Jalalian, M. (2013). Complementary alternative medicine use among patients with type 2 diabetes mellitus in the primary care setting: A cross-sectional study in Malaysia. *BMC Complementary and Alternative Medicine*, 13. <https://doi.org/10.1186/1472-6882-13-148>
- Cody, G. W. (2018). The Origins of Integrative Medicine-The First True Integrators: The Roots EVOLUTION OF A TRANSFORMATIVE MEDICINE PARADIGM. In *Integrative Medicine • (Vol. 17, Issue 1)*.
- Devpura, G., Tomar, B. S., Nathiya, D., Sharma, A., Bhandari, D., Haldar, S., Balkrishna, A., & Varshney, A. (2021). Randomized placebo-controlled pilot clinical trial on the efficacy of ayurvedic treatment regime on COVID-19 positive patients. *Phytomedicine*, 84. <https://doi.org/10.1016/j.phymed.2021.153494>
- Division, T. & C. M. (2017). 2017 T&CMD Annual Report.
- Division, T. an C. (2015). 2015 T&CMD Annual Report.
- Elvina, M. (2020). Integrative Medicine Through Islamic Perspective in Respecting Pandemic Covid-19. *International Journal of Islamic Medicine*, 1(1), 43–53. <https://doi.org/10.37275/ijim.v1i1.6>
- Fadel, H. E. (2008). What is Islamic Medicine? How Does it Relate to Contemporary Medicine? *Journal of the Islamic Medical Association of North America*, 40(2), 56–58. <https://doi.org/10.5915/40-2-4448>
- Farhadi, K., Schwebel, D. C., Saeb, M., Choubsaz, M., Mohammadi, R., & Ahmadi, A. (2009). The effectiveness of wet-cupping for nonspecific low back pain in Iran: A randomized controlled trial. *Complementary Therapies in Medicine*, 17(1), 9–15. <https://doi.org/10.1016/j.ctim.2008.05.003>
- Gasmi, A., Chirumbolo, S., Peana, M., Noor, S., Menzel, A., Dadar, M., & Björklund, G. (2011). The Role of Diet and Supplementation of Natural Products in COVID-19 Prevention. *Phytomedicine*. <https://doi.org/10.1007/s12011-021-02623-3/Published>
- Günalan, E., Cebioğlu, İ. K., & Çonak, Ö. (2021). The Popularity of the Biologically-Based Therapies During Coronavirus Pandemic Among the Google Users in the USA, UK, Germany, Italy and France. *Complementary Therapies in Medicine*, 58. <https://doi.org/10.1016/j.ctim.2021.102682>
- Hamed Abdalla, M. E. A., Ali, A. M., & Loong, L. (2020). The use of complementary and alternative medicine (CAM) among cancer patients at a tertiary hospital in Malaysia. *Complementary Therapies in Medicine*, 50. <https://doi.org/10.1016/j.ctim.2020.102343>
- Ho, C. C. K., & Tan, H. M. (2011). Rise of herbal and traditional medicine in erectile dysfunction management. *Current Urology Reports*, 12(6), 470–478. <https://doi.org/10.1007/s11934-011-0217-x>

- Hossen, A., & Westhues, A. (2012). In Search of Healing Between Two Worlds: The Use of Traditional and Modern Health Services by Older Women in Rural Bangladesh. *Social Work in Health Care*, 51(4), 327–344. <https://doi.org/10.1080/00981389.2011.638223>
- Innes, K. E., Selfe, T. K., Kandati, S., Wen, S., & Huysmans, Z. (2018). Effects of Mantra Meditation versus Music Listening on Knee Pain, Function, and Related Outcomes in Older Adults with Knee Osteoarthritis: An Exploratory Randomized Clinical Trial (RCT). *Evidence-Based Complementary and Alternative Medicine*, 2018. <https://doi.org/10.1155/2018/7683897>
- Irmak, Z., Tanrıverdi, Ö., Ödemiş, H., & Uysal, D. D. (2019). Use of complementary and alternative medicine and quality of life of cancer patients who received chemotherapy in Turkey. *Complementary Therapies in Medicine*, 44, 143–150. <https://doi.org/10.1016/j.ctim.2019.04.008>
- Israili, Z. H. (2014). Antimicrobial Properties of Honey. *American Journal of Therapeutics*, 21, 304–323. www.americantherapeutics.com
- Jazieh, A. R., Al Sudairy, R., Abulkhair, O., Alaskar, A., Al Safi, F., Sheblaq, N., Young, S., Issa, M., & Tamim, H. (2012). Use of complementary and alternative medicine by patients with cancer in Saudi Arabia. *Journal of Alternative and Complementary Medicine*, 18(11), 1045–1049. <https://doi.org/10.1089/acm.2011.0266>
- Kashi, A., & Shah, M. E. (2023). Bibliometric Review on Sustainable Finance. In *Sustainability (Switzerland)* (Vol. 15, Issue 9). MDPI. <https://doi.org/10.3390/su15097119>
- Keene, M. R., Heslop, I. M., Sabesan, S. S., & Glass, B. D. (2019). Complementary and alternative medicine use in cancer: A systematic review. *Complementary Therapies in Clinical Practice*, 35, 33–47. <https://doi.org/10.1016/j.ctcp.2019.01.004>
- Kesharwani, R. K., Misra, K., & Singh, D. B. (2019). Perspectives and challenges of tropical medicinal herbs and modern drug discovery in the current scenario. *Asian Pacific Journal of Tropical Medicine*, 12(1), 19–25. <https://doi.org/10.4103/1995-7645.250337>
- Khalil, M. K. M., Al-Eidi, S., Al-Qaed, M., & AlSanad, S. (2018). The future of integrative health and medicine in Saudi Arabia. *Integrative Medicine Research*, 7(4), 316–321. <https://doi.org/10.1016/j.imr.2018.06.004>
- Krousel-Wood, M. A., Muntner, P., Joyce, C. J., Islam, T., Stanley, E., Holt, E. W., Morisky, D. E., He, J., & Webber, L. S. (2010). Adverse effects of complementary and alternative medicine on Antihypertensive medication adherence: FINDINGS from the cohort study of medication adherence among older adults. *Journal of the American Geriatrics Society*, 58(1), 54–61. <https://doi.org/10.1111/j.1532-5415.2009.02639.x>
- Lai, X., Dong, Z., Wu, S., Zhou, X., Zhang, G., Xiong, S., Wu, W., Cao, R., Wang, X., Hua, Q., Du, J., Fan, J., Mao, J., Jiang, W., Yuan, H., Chen, Y., Xu, Y., Li, Z., Zhang, J., ... Gao, Y. (2022). Efficacy and Safety of Chinese Herbal Medicine Compared with Losartan for Mild Essential Hypertension: A Randomized, Multicenter, Double-Blind, Noninferiority Trial. *Circulation: Cardiovascular Quality and Outcomes*, 15(3), E007923. <https://doi.org/10.1161/CIRCOUTCOMES.121.007923>
- Lee, D. Y. W., Li, Q. Y., Liu, J., & Efferth, T. (2021). Traditional Chinese herbal medicine at the forefront battle against COVID-19: Clinical experience and scientific basis. *Phytomedicine*, 80. <https://doi.org/10.1016/j.phymed.2020.153337>
- Lesley Rees, & Andrew Weil. (2001). Integrated medicine Imbues orthodox medicine with the values of complementary medicine. *BMJ*, 322.
- Li, X. M. (2011). Treatment of asthma and food allergy with herbal interventions from traditional Chinese medicine. *Mount Sinai Journal of Medicine*, 78(5), 697–716. <https://doi.org/10.1002/msj.20294>
- Liu, X. L., Li, M. G., Wang, X., Dang, Z., Yu, L., Wang, X. B., Jiang, Y. Y., & Yang, Z. Y. (2019). Effects of adjuvant traditional Chinese medicine therapy on long-term survival in patients with hepatocellular carcinoma. *Phytomedicine*, 62. <https://doi.org/10.1016/j.phymed.2019.152930>
- Mogharbel, G. H., Badawi, A. S., Zaman, A. Y., Abd Elmoniem, M. M., Abdel-Rahman, I. M., Alenazi, M. E., Shah, F. A., Aly, M. A., Imam, S. N., Alenazi, N. E., & El Sayed, S. M. (2023). Therapeutic benefits of prophetic medicine remedies in treating hematological diseases (A review article). *American Journal of Blood Research*, 13(4), 130–142. <http://www.ncbi.nlm.nih.gov/pubmed/37736537> <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=PMC10509466>
- Mukhopadhyay, S., Holla, B., Bhargav, H., Ramakrishna, K. K., Chikkanna, U., Varambally, S., & Gangadhar, B. N. (2022). Integrative Medicine as “Medicine”: A Perspective. *Integrative Medicine Reports*, 1(1), 86–94. <https://doi.org/10.1089/imr.2022.0054>
- Nagamia, H. F. (1996). New Definition of Islamic Medicine: “Neo-Islamic Medicine.” *JIMA*, 28.
- Rahmatullah, M., Hasan, A., Parvin, W., Moniruzzaman, Md., Khatun, A., Jahan, F. I., & Jahan, R. (2012). Medicinal plants and formulations used by the Soren Clan of the Santal Tribe in Rajshahi District, Bangladesh for treatment of various ailments. *Afr J Tradit Complement Altern Med*, 9(3), 350–359.
- Rahmatullah, M., Jahan, R., Azman, F. M. S., Hossan, S., Mollik, M. A. H., & Rahman, T. (2011). Folk medicinal uses of Verbenaceae family plants in Bangladesh. *Afr J Tradit Complement Altern Med*, 8, 53–65.
- Ranganathan, S. (2015). Rethinking ‘Efficacy’: Ritual Healing and Trance in the Mahanubhav Shrines in India. *Culture, Medicine and Psychiatry*, 39(3), 361–379. <https://doi.org/10.1007/s11013-014-9421-8>
- Sajid, M. I. (2016). Hijama therapy (wet cupping) - its potential use to complement British healthcare in practice, understanding, evidence and regulation. *Complementary Therapies in Clinical Practice*, 23, 9–13. <https://doi.org/10.1016/j.ctcp.2016.01.003>

- Saniotis, A. (2012). Islamic Medicine and Evolutionary Medicine: A Comparative Analysis. *Journal of the Islamic Medical Association of North America*, 44(1). <https://doi.org/10.5915/44-1-8780>
- Saniotis, A. (2018). Understanding Mind/Body Medicine from Muslim Religious Practices of Salat and Dhikr. *Journal of Religion and Health*, 57(3), 849–857. <https://doi.org/10.1007/s10943-014-9992-2>
- Sax, W. (2014). Ritual healing and mental health in India. *Transcultural Psychiatry*, 51(6), 829–849. <https://doi.org/10.1177/1363461514524472>
- Sirois, F. M., Jiang, L., & Upchurch, D. M. (2018). Use and Disclosure of Complementary Health Approaches in US Adults With Cardiovascular Disease. *American Journal of Cardiology*, 122(1), 170–174. <https://doi.org/10.1016/j.amjcard.2018.03.014>
- Smith, C. A., Armour, M., & Ee, C. (2016). Complementary Therapies and Medicines and Reproductive Medicine. *Seminars in Reproductive Medicine*, 34(2), 67–73. <https://doi.org/10.1055/s-0035-1571194>
- Tick, H., Nielsen, A., Pelletier, K. R., Bonakdar, R., Simmons, S., Glick, R., Ratner, E., Lemmon, R. L., Wayne, P., & Zador, V. (2018). Evidence-Based Nonpharmacologic Strategies for Comprehensive Pain Care: The Consortium Pain Task Force White Paper. *Explore*, 14(3), 177–211. <https://doi.org/10.1016/j.explore.2018.02.001>
- Wazaify, M., Afifi, F. U., El-Khateeb, M., & Ajlouni, K. (2011). Complementary and alternative medicine use among Jordanian patients with diabetes. *Complementary Therapies in Clinical Practice*, 17(2), 71–75. <https://doi.org/10.1016/j.ctcp.2011.02.002>
- WHO Global Report on Traditional and Complementary Medicine 2019 - World Health Organization - Google Books. (n.d). Retrieved April 20, 2022, from <https://books.google.com.my/books?hl=en&lr=&id=WHOyDwAAQBAJ&oi=fnd&pg=PP1&dq=info:vAFSGxo-FH0J:scholar.google.com/&ots=h2gsB9aVkf&sig=8AMoiyutx4znGgJIwubWoXtMYF8#v=onepage&q&f=false>
- Williams, R. M., Ehde, D. M., Day, M., Turner, A. P., Hakimian, S., Gertz, K., Ciol, M., McCall, A., Kincaid, C., Pettet, M. W., Patterson, D., Suri, P., & Jensen, M. P. (2020). The chronic pain skills study: Protocol for a randomized controlled trial comparing hypnosis, mindfulness meditation and pain education in Veterans. *Contemporary Clinical Trials*, 90. <https://doi.org/10.1016/j.cct.2020.105935>
- Yin, X., Li, W., Liang, T., Lu, B., Yue, H., Li, S., Zhong, V. W., Zhang, W., Li, X., Zhou, S., Mi, Y., Wu, H., & Xu, S. (2022). Effect of Electroacupuncture on Insomnia in Patients With Depression: A Randomized Clinical Trial. *JAMA Network Open*, 5(7), E2220563. <https://doi.org/10.1001/jamanetworkopen.2022.20563>