Insight into the characteristics of research published in traditional, complementary, alternative, and integrative medicine journals: a bibliometric analysis

Jeremy Y. Ng

Abstract

Background: Traditional, complementary, alternative and integrative medicine (TCAIM) can be described as diverse medical and healthcare interventions, practices, products, or disciplines that are not considered as part of conventional medicine. Inherent in its definition, TCAIMs are comprised of a wide variety of therapies with highly variable safety and effectiveness evidence profiles. Despite this, the use of many TCAIMs is highly prevalent among patients globally. The present study consists of a bibliometric analysis of TCAIM journals.

Methods: A single search of all International Standard Serial Number (ISSNs) of all journals categorized as “complementary and alternative medicine” (code 2707) based on the All Science Journal Classification (ASJC) was run on Scopus on April 17, 2021. All publication types were included; no further search limits were applied. The following bibliometric data were collected: number of publications (in total and per year), authors and journals; open access status; journals publishing the highest volume of literature and their impact factors; language, countries, institutional affiliations, and funding sponsors of publications; most productive authors; and highest-cited publications. Trends associated with this subset of publications were identified and presented. Bibliometric indicators of production were calculated, and bibliometric networks were constructed and visualized using the software tool VOSviewer.

Results: A total of 172,466 publications (42,331 open access), were published by 219,680 authors in 143 journals from 1938 to 2021. Since the 1940s, an upward trend with respect to the volume of publications can be observed, with a steep increase observed between the mid-2000s and mid-2010s. The journal that published the largest number of publications was the Journal of Natural Products ($n = 15,144$). The most productive countries included China ($n = 45,860$), the United States ($n = 29,523$), and Germany ($n = 10,120$); a number of the most common institutional affiliations and funding sponsors also originated from these three countries.

© The Author(s). 2021 Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article’s Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article’s Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit http://creativecommons.org/licenses/by/4.0/. The Creative Commons Public Domain Dedication waiver (http://creativecommons.org/publicdomain/zero/1.0/) applies to the data made available in this article, unless otherwise stated in a credit line to the data.
**Conclusions:** The number of publications collectively published in TCAIM journals follows an upward trend. Given a high prevalence of TCAIM use among patients, increased acceptance of TCAIM among conventional healthcare providers, and growing interest in the research of TCAIM, future work should continue to investigate and track changes in the publication characteristics of the emerging research on this topic.

**Keywords:** Bibliometric analysis, Complementary and alternative medicine, Integrative health, Integrative medicine, Research trends, Scientometrics

**Background**

Complementary and alternative medicine is generally defined as a group of diverse medical and healthcare interventions, practices, products or disciplines that are not considered as part of conventional medicine [1]. Specifically, the National Center for Complementary and Integrative Health (NCCIH) defines “complementary” medicine as a non-mainstream practice used *together with* conventional medicine, whereas “alternative” medicine refers to a non-mainstream practice used *in place of* conventional medicine [2]. In contrast, “integrative health” is defined as the coordinated delivery of conventional and complementary approaches together [2]. These three words — complementary, alternative, and integrative — comprise the most common ways to refer to these types of therapies [3], in addition to “traditional medicine” which has been defined by the World Health Organization as “the sum total of the knowledge, skill and practices based on the theories, beliefs and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness” [4]. For the purpose of the present study, these therapies will be referred to collectively as “traditional, complementary, alternative and integrative medicine” or “TCAIMs” hereafter. At present, a lack of consensus exists regarding how to categorize TCAIMs; in fact, by definition every therapy that falls under the umbrella of “TCAIM” exists as a result of being considered outside of the purview of conventional Western medical practices [3]. Therefore, one TCAIM therapy can be highly unrelated to another due to the fact that each originates from a different region in the world, culture, system of traditional medicine, and school of thought [4, 5]. Despite these challenges, attempts have been made to categorize TCAIMs. For example, the NCCIH divides TCAIM therapies into two main types: 1) natural products and 2) mind and body practices. Within the former category, they include therapies such as herbs, vitamins and minerals, and probiotics, while in the latter, they include therapies such as yoga, chiropractic and osteopathic manipulation, and meditation, as well as acupuncture, relaxation techniques, tai chi, qi gong, and hypnotherapy, among others [2]. Despite these efforts, the NCCIH has stated, however, that some TCAIMs may not fit neatly into either of these two groups, citing many systems of TCAIM including practices of traditional healers, Ayurvedic medicine, traditional Chinese medicine, homeopathy, naturopathy, and functional medicine [2].

Regardless of how TCAIMs are categorized, these therapies are perceived to be of value by their proponents for their emphasis on a holistic, patient-focused approach to healthcare, which include mental, emotional, functional, spiritual, economic, and social aspects [2, 6]. TCAIM is widely used around the world, with 88% of World Health Organization member states acknowledging their use, which by definition means that these 170 countries have formally developed policies, laws, regulations, programs and offices for TCAIM [4]. The prevalence of TCAIM use is high in many Western countries; for example, it is estimated that around 80% of Canadians have used TCAIM [7]. The prevalence of TCAIM use is also documented to be high among certain patient populations; in cancer patients, as many as 90% report using some type of TCAIM [8–10]. TCAIM is used by these patients for a variety of reasons, including symptom relief, improved quality of life, supplementing conventional therapy, supporting one’s philosophical orientations toward health, and achieving a sense of control over one’s care [11–13]. Integrative medicine (the use of complementary and conventional therapies) is becoming increasingly popular among patients and practitioners [14, 15], and sub-specializations of integrative care for specific diseases/conditions have also been established, such as integrative oncology [16, 17].

While some TCAIMs, such as meditation and yoga [18, 19], have undergone more thorough testing and have been found to be generally safe and effective, others have not been adequately researched to determine their effectiveness, and some have been found to be potentially harmful or interact negatively with conventional medicines [20–22]. The belief among patients that “natural means safe and better” [23] is well-documented, however, evidence from the research literature suggests otherwise. Many herbal and dietary supplements can be harmful when taken in large quantities. Certain weight loss and body-building supplements have been shown to cause hepatotoxicity or even hepatic failure at therapeutic doses [24]. Furthermore, systemized pharmacovigilance of TCAIMs
is poorly coordinated on a national and international level, and TCAIM therapies are generally not held to the same standards of regulation as that of pharmaceutical medicines in terms of quality, effectiveness, and safety [20].

The increase in popularity and prevalence of TCAIM use among patients, and growing acknowledgement among conventional healthcare providers that a need exists to approach TCAIM therapies, their traditions, and their practitioners with respect, are among some of the reasons for an increase in TCAIM research productivity which has resulted in a growth in the volume of the published literature over the past few decades [25–27].

The application of a research method known as a bibliometric analysis can facilitate a better understanding of a given field, such as that of TCAIM. A bibliometric analysis involves the statistical assessment of scientific publications, to identify the characteristics and determine the impact of the literature published in a specific academic discipline [28–30]. This increased interest in TCAIM research has led to the establishment and indexing of multiple TCAIM journals. While a number of bibliometric analyses have made attempts to evaluate the characteristics of all publications published in the area of traditional, complementary, alternative, and/or integrative medicine through the use of various search strategies [31–35], no study has comprehensively assessed the characteristics of the publications found within these source titles to date. Thus, the purpose of the present study is to provide current insight into the characteristics of publications published across TCAIM journals through a bibliometric analysis.

Methods

Publication search and characteristics

The 2021 Scopus Source List [36] was downloaded, and all Scopus-indexed journals belonging to the “complementary and alternative medicine” category (code 2707) were identified based on the All Science Journal Classification (ASJC). A single search containing the International Standard Serial Numbers (ISSNs) of all of these journals was run on Scopus on April 17, 2021; the search strategy can be found in Table 1. Search results were exported on the same day to prevent discrepancies between daily database updates. Searches were only conducted on Scopus because it is the largest abstract and citation database of peer-reviewed literature [37]; in comparison, Web of Science contains considerably fewer TCAIM-categorized journals, while OVID databases do not provide certain metrics such as publication citation counts [38]. All publication types were included, and no further search limits were applied. The following bibliometric data were collected: number of publications (in total and per year), authors and journals; open access status; journals publishing the highest volume of

| Table 1 Scopus Search Strategy Executed on April 17, 2021 |
|----------------------------------------------------------|
| ISSN (25755776) OR ISSN (03601293) OR ISSN (09645284) OR ISSN (22129588) OR ISSN (26624052) OR ISSN (01896016) OR ISSN (16146891) OR ISSN (10762809) OR ISSN (10814000) OR ISSN (1096942X) OR ISSN (10895159) OR ISSN (10786791) OR ISSN (15223396) OR ISSN (09939360) OR ISSN (0192415X) OR ISSN (00291575) OR ISSN (17535174) OR ISSN (16148339) OR ISSN (15734230) OR ISSN (18393735) OR ISSN (22099199) OR ISSN (10338330) OR ISSN (10338330) OR ISSN (14726884) OR ISSN (07177917) OR ISSN (00070785) OR ISSN (16720415) OR ISSN (20956975) OR ISSN (17498854) OR ISSN (02532670) OR ISSN (09302786) OR ISSN (2045709X) OR ISSN (17461340) OR ISSN (10360913) OR ISSN (08896976) OR ISSN (14611149) OR ISSN (15332101) OR ISSN (02684055) OR ISSN (25042092) OR ISSN (17443881) OR ISSN (06965299) OR ISSN (13536117) OR ISSN (22150838) OR ISSN (04156412) OR ISSN (18763820) OR ISSN (13516647) OR ISSN (1741427X) OR ISSN (11762330) OR ISSN (15083070) OR ISSN (14653753) OR ISSN (16614119) OR ISSN (00180599) OR ISSN (08879311) OR ISSN (14759416) OR ISSN (09747168) OR ISSN (09725938) OR ISSN (15347354) OR ISSN (1546993X) OR ISSN (23252812) OR ISSN (11773936) OR ISSN (22142220) OR ISSN (19406223) OR ISSN (06924562) OR ISSN (10471979) OR ISSN (19826206) OR ISSN (17460689) OR ISSN (19725359) OR ISSN (00750185) OR ISSN (20052901) OR ISSN (16723597) OR ISSN (10755535) OR ISSN (10286020) OR ISSN (09759476) OR ISSN (22311866) OR ISSN (13608592) OR ISSN (15446301) OR ISSN (01438042) OR ISSN (15533849) OR ISSN (15533849) OR ISSN (14468263) OR ISSN (17464269) OR ISSN (21565872) OR ISSN (10395472) OR ISSN (12268453) OR ISSN (22108033) OR ISSN (10496475) OR ISSN (19906875) OR ISSN (16904240) OR ISSN (18610293) OR ISSN (10633864) OR ISSN (18344825) OR ISSN (20936966) OR ISSN (10841288) OR ISSN (13636390) OR ISSN (1715984X) OR ISSN (22254110) OR ISSN (18801447) OR ISSN (18638678) OR ISSN (00252514) OR ISSN (19336586) OR ISSN (11233995) OR ISSN (15763080) OR ISSN (07346875) OR ISSN (1934578X) OR ISSN (22103155) OR ISSN (19408153) OR ISSN (08098131) OR ISSN (13003928) OR ISSN (09747877) OR ISSN (15928386) OR ISSN (16159071) OR ISSN (13880209) OR ISSN (16904240) OR ISSN (16156384) OR ISSN (08344825) OR ISSN (19447113) OR ISSN (16248597) OR ISSN (16286947) OR ISSN (00329043) OR ISSN (18193455) OR ISSN (15160572) OR ISSN (15760952) OR ISSN (18873869) OR ISSN (18888526) OR ISSN (18789730) OR ISSN (10150684) OR ISSN (10950656) OR ISSN (15564061) OR ISSN (13021192) OR ISSN (23264500) OR ISSN (09735070) OR ISSN (00988615) OR ISSN (1560604X) OR ISSN (26616084) OR ISSN (23118571) OR ISSN (0722348X) OR ISSN (22129596) OR ISSN (26624060) OR ISSN (15734218) OR ISSN (2091203) OR ISSN (26627671) OR ISSN (23788763) OR ISSN (19930402) OR ISSN (18755364) OR ISSN (25042106) OR ISSN (22150846) OR ISSN (14394359) OR ISSN (17414288) OR ISSN (16614127) OR ISSN (15505138) OR ISSN (14764245) OR ISSN (23207094) OR ISSN (0751068) OR ISSN (22134239) OR ISSN (13522106) OR ISSN (10932099) OR ISSN (14772213) OR ISSN (9762809) OR ISSN (22311874) OR ISSN (2515690X) OR ISSN (21463208) OR ISSN (20934947) OR ISSN (22108041) OR ISSN (15403580) OR ISSN (21468397) OR ISSN (15206025) OR ISSN (22346856) OR ISSN (20957548) OR ISSN (18813747) OR ISSN (14393066) OR ISSN (15559475) OR ISSN (22013163) OR ISSN (22111069) OR ISSN (17445116) OR ISSN (9762787) OR ISSN (10991565) OR ISSN (17652847) OR ISSN (14390221) OR ISSN (19885806) OR ISSN (23264519) OR ISSN (26160692) OR ISSN (10835257) OR ISSN (25892894) OR ISSN (16721977) OR ISSN (10015302)
Bibliometric indicators of production

Relative growth rates and doubling times were calculated for publications published between 1938 and 2020. The relative growth rate represents the increase in the number of publications published per unit of time. The relative growth rate was calculated based on the following equation: 

\[
\text{Relative Growth Rate} = \frac{\log e W_2 - \log e W_1}{T_2 - T_1},
\]

where \( \log e W_1 \) represents the log of initial number of articles, and \( \log e W_2 \) represents the log of final number of articles after a specific period of interval. \( T_2 - T_1 \) represents the unit difference between the initial time and the final time. Doubling time is defined as the amount of time required for the subject matter to double its production. The doubling time was calculated based on the following equation: 

\[
DT = \frac{0.693}{\text{Relative Growth Rate}}.
\]

Price’s law was also applied to the subset of publications analysed [41]. This law proposes that the growth of scientific production follows an exponential function, and represents one of the most common indicators used to analyse productivity in a specific discipline or subset of publications. To assess whether the increase in data conforms to Price’s law of exponential growth, we carried out a linear adjustment of the values and another adjustment to an exponential curve.

Results

A total of 172,466 publications (42,331 open access), were published by 219,680 unique authors in 143 journals from 1938 to 2021. Since the 1940s, an upward trend with respect to the volume of publications can be observed, with a steep increase observed between the mid-2000s and mid-2010s. This upward trend has continued with 2020 marking the year with the highest number of publications to date. The Journal of Natural Products \((n = 15,144)\) published the largest number of publications indexed in Scopus, followed by Zhongguo Zhongyao Zazhi \((n = 14,577)\), and Planta Medica \((n = 10,793)\). All journals included within this bibliometric analysis were hand-searched on InCites Journal Citation Reports [42]. As of 2020, 83 journals were still active (57.6%), of which 35 had a 2019 impact factor (range from 0.200 to 5.487). Table 2 provides complete details of the journals included in this bibliometric analysis, including the journal name, ISSN, whether the journal is active or inactive (as of 2020), coverage period, title history indication, publisher name, number of publications indexed in Scopus, and the 2019 impact factor (if available).

The subject area containing the largest number of publications was medicine \((n = 172,456)\), followed by pharmacology, toxicology and pharmaceutics \((n = 86,902)\), then biochemistry, genetics and molecular biology \((n = 40,262)\). Publications were primarily published in English \((n = 135,718)\), followed by Chinese \((n = 24,614)\), German \((n = 8611)\). The most common document types were article \((n = 139,540)\) and review \((n = 13,418)\); articles primarily include original research, while reviews include literature, scoping, and systematic reviews. The most productive countries included China \((n = 45,860)\), the United States \((n = 29,523)\), and Germany \((n = 10,120)\). The most common affiliations were the China Academy of Chinese Medical Sciences \((n = 3560)\), the Beijing University of Chinese Medicine \((n = 2896)\), and the Chinese Academy of Sciences \((n = 2896)\); the most common funding sponsors were the National Natural Science Foundation of China \((n = 5711)\), the National Institutes of Health \((n = 4055)\), and the US Department of Health and Human Services \((n = 4032)\). The general characteristics of eligible publications are summarized in Table 3. In addition, the 100 most highly published authors are provided in Table 4, and the 100 highest-cited publications are provided in Table 5.

Figure 1 depicts the number of publications published per year from 1938 to 2020, inclusive of an exponential and linear curve. Mathematical adjustment to an exponential curve \((y = 30.6999e^{0.0738x})\), as shown in this figure, resulted in a correlation coefficient \(r = 0.9698\), which indicates that 5.94% of variability remains unexplained by this adjustment. In contrast, the linear adjustment \((y = 97.915x - 1971.9)\) of the measured values provides an \(r = 0.8160\), and thus an unexplained variability of 33.42%. These results suggest fulfilment of Price’s Law, with scientific production within CAIM journals showing exponential growth. Additionally, the relative growth rate was found to range from 0.05 to 0.67. Doubling time was found to range from 1.04 to 15.02. Table 6 provides annual relative growth rates and doubling times.

Bibliometric networks were constructed and visualized using the software tool VOSviewer, and include all 172,466 captured by the present study’s search. This added layer of analysis of the most influential subset of publications captured provides a greater understanding of the relationship that exists between certain items (i.e. countries, keywords, authors, journals, etc.). In each bibliometric network (figure), each item is represented in a network visualisation by a label and a circle; the weight of an item determines the size of the label and the circle of an item. Figure 2 depicts a co-authorship analysis of the 50 most productive countries. In a co-authorship analysis, the relatedness of items is determined based on the number of co-authored publications. From this figure, it can be seen that while China is the most productive country, Chinese authors tend to collaborate less with researchers in other countries as shown by the distance between lines. In contrast, American authors tend to collaborate with many countries internationally, while German authors tend to collaborate more with researchers in other European countries. Figure 3 depicts
| Position | Journal Name                        | ISSN                  | Active or Inactive (as of 2020) | Coverage Period | Title History Indication                                                                 | Publisher Name                      | Number of Publications Indexed in Scopus | 2019 Impact Factor |
|----------|------------------------------------|-----------------------|---------------------------------|-----------------|------------------------------------------------------------------------------------------|--------------------------------------|------------------------------------------|-------------------|
| 1        | Journal of Natural Products        | 1633864 (Print); 15206025 (Electronic) | Active                          | 1978-ongoing, 1973, 1971, 1949 | Formerly known as Lloydia; not categorized as "complementary and alternative medicine" by Scopus | American Chemical Society              | 15144                      | 3.782                           |
| 2        | Zhongguo Zhongyao Zazhi            | 10015302 (Print)      | Active                          | 1989-ongoing    | Formerly known as Zhong Yao Tong Bao (Beijing, China: 1981); not categorized as "complementary and alternative medicine" by Scopus | Zhongguo Zhongyi Yanjiuyuan          | 14577                      | N/A                            |
| 3        | Planta Medica                      | 00320943 (Print); 14390221 (Electronic) | Active                          | 1965-ongoing, 1961 | N/A                                                                                       | Georg Thieme Verlag                  | 10793                      | 2.687                           |
| 4        | The Journal of the American Osteopathic Association | 986151 (Print) | Active                          | 1945-ongoing    | N/A                                                                                       | American Osteopathic Association     | 9533                       | N/A                            |
| 5        | Evidence-Based Complementary and Alternative Medicine | 1741427X (Print); 17414288 (Electronic) | Active                          | 2005-ongoing    | N/A                                                                                       | Hindawi Publishing Corporation       | 9261                       | 1.813                           |
| 6        | Chinese Traditional and Herbal Drugs | 02532670 (Print)     | Active                          | 2006-ongoing    | N/A                                                                                       | Chung Tsao Yao Tsa Chih Pien Chi Pu   | 8704                       | N/A                            |
| 7        | Natural Product Communications     | 1934578X (Print); 15559475 (Electronic) | Active                          | 2008-ongoing    | N/A                                                                                       | SAGE Publications Inc.               | 5800                       | 0.468                           |
| 8        | Pharmaceutical Biology             | 13880209 (Print); 17445116 (Electronic) | Active                          | 1975-ongoing, 1961-1972 | Formerly known as International Journal of Pharmacognosy; not categorized as "complementary and alternative medicine" by Scopus | Taylor & Francis                     | 4901                       | 2.971                           |
| 9        | Phytomedicine                      | 09447113 (Print)      | Active                          | 1994-ongoing    | N/A                                                                                       | Elsevier BV                         | 4212                       | 4.268                           |
| 10       | BMC Complementary and Alternative Medicine | 14726882 (Print) | Inactive                        | 2001-2019       | Continued as BMC Complementary Medicine and Therapies; see position #63                  | BioMed Central                       | 3902                       | N/A (Inactive)                  |
| 11       | Journal of Alternative and Complementary Medicine | 10755535 (Print) | Active                          | 1995-ongoing    | N/A                                                                                       | Mary Ann Liebert Inc.                | 3709                       | 2.256                           |
| 12       | Journal of Asian Natural Products Research | 10286020 (Print); 14772213 (Electronic) | Active                          | 1998-ongoing    | N/A                                                                                       | Taylor & Francis                     | 2822                       | 1.345                           |
| 13       | American Journal of Chinese Medicine | 0192415X (Print)     | Active                          | 1979-ongoing, 1974-1977 | Formerly known as Comparative Medicine East and West; not categorized as "complementary and alternative medicine" by Scopus | World Scientific Publishing Co       | 2719                       | 3.682                           |
| 14       | British Homeopathic                | 00070785 Inactive     | 1998-2001,                         |                 | Continued as Homeopathy:                                                                  | Elsevier BV                         | 2652                       | N/A                            |
| Position | Journal Name | ISSN | Active or Inactive (as of 2020) | Coverage Period | Title History Indication | Publisher Name | Number of Publications Indexed in Scopus | 2019 Impact Factor |
|----------|--------------|------|----------------------------------|-----------------|--------------------------|----------------|----------------------------------------|-------------------|
| 15       | American Journal of Clinical Hypnosis | 00029157 (Print); 09652299 (Print) | Active | 1958-ongoing | N/A | Taylor and Francis Inc. | 2573 | 0.766 |
| 16       | Complementary Therapies in Medicine | 09652299 (Print) | Active | 1993-ongoing | Formerly known as Complementary Medical Research; see position #123 | Churchill Livingstone | 2436 | 2.063 |
| 17       | Chinese Journal of Integrative Medicine | 16720415 (Print); 19930402 (Electronic) | Active | 2005-ongoing | Formerly known as Chinese Journal of Integrated Traditional and Western Medicine; not categorized as “complementary and alternative medicine” by Scopus | Springer Nature Switzerland AG | 2170 | 1.545 |
| 18       | Manuelle Medizin | 00252514 (Print); 14330466 (Electronic) | Active | 1973-ongoing | N/A | Springer Verlag | 2003 | N/A |
| 19       | Journal of Bodywork and Movement Therapies | 13608592 (Print) | Active | 1996-ongoing | N/A | Churchill Livingstone | 1987 | N/A |
| 20       | Phytochemical Analysis | 09580344 (Print); 10991565 (Electronic) | Active | 1990-ongoing | N/A | John Wiley & Sons Inc. | 1954 | 2.772 |
| 21       | Alternative Therapies in Health and Medicine | 10786791 (Print) | Active | 1995-ongoing | N/A | InnoVision Communications | 1892 | 0.937 |
| 22       | Zhong Xi Yi Jie He Xue Bao = Journal of Chinese integrative medicine | 16721977 (Print) | Inactive | 2003-2012 | Continued as Journal of Integrative Medicine; not categorized as “complementary and alternative medicine” by Scopus | Shanghai Association of Integrative Medicine | 1861 | N/A (Inactive) |
| 23       | Holistic Nursing Practice | 08879311 (Print); 15505138 (Electronic) | Active | 1986-ongoing | Formerly known as Topics in Clinical Nursing; not categorized as “complementary and alternative medicine” by Scopus | Lippincott Williams & Wilkins Ltd. | 1722 | 0.968 |
| 24       | Zeitschrift für Phytotherapie: Offizielles Organ der Ges. f. Phytotherapie e.V | 0722348X (Print) | Active | 1985-ongoing, 1982 | N/A | Hippokrates Verlag | 1648 | N/A |
| 25       | Alternative and Complementary Therapies | 10762809 (Print) | Active | 1999-ongoing | N/A | Mary Ann Liebert Inc. | 1631 | N/A |
| 26       | Journal of Medicinal Plant Research | 19960875 (Print) | Inactive | 2009-2011 | N/A | Academic Journals | 1495 | N/A (Inactive) |
| 27       | EXPLORE: The Journal of Science and Healing | 15508307 (Print) | Active | 2005-ongoing | N/A | Elsevier BV | 1462 | 1.485 |
| 28       | Journal of Natural Medicines | 18610293 (Print) | Active | 2006-ongoing | Formerly known as Natural Medicines; not categorized | Springer Verlag | 1461 | 2.055 |
Table 2 Characteristics of TCAIM Journals Indexed in Scopus (n = 143) (Continued)

| Position | Journal Name                                           | ISSN | Active or Inactive (as of 2020) | Coverage Period     | Title History Indication                                      | Publisher Name                      | Number of Publications Indexed in Scopus | 2019 Impact Factor |
|----------|--------------------------------------------------------|------|---------------------------------|---------------------|----------------------------------------------------------------|-------------------------------------|------------------------------------------|-------------------|
| 29       | Indian Journal of Traditional Knowledge               | 09725938 (Print); 09751068 (Electronic) | Active              | 2008-ongoing         | N/A                                                            | National Institute of Science        | 1446                       | 0.731            |
| 30       | Acupuncture in Medicine                               | 09645284 (Print)                         | Active              | 1996-ongoing         | N/A                                                            | BMJ Publishing Group                 | 1391                       | 2.129            |
| 31       | Deutsche Zeitschrift für Akupunktur                   | 04156412 (Print); 14394359 (Electronic) | Inactive            | 1984-2016 (cancelled)| N/A                                                            | Springer Medizin                     | 1344                       | N/A               |
| 32       | Integrative Cancer Therapies                          | 15347354 (Print)                         | Active              | 2002-ongoing         | N/A                                                            | Sage Science Press                   | 1258                       | 2.379            |
| 33       | Complementary Therapies in Clinical Practice          | 17443881 (Print)                         | Active              | 2005-ongoing         | Formerly known as Complementary Therapies in Nursing and Midwifery; see position #76 | Elsevier BV                          | 1231                       | 1.770            |
| 34       | Focus on Alternative and Complementary Therapies      | 14653753 (Print)                         | Inactive            | 2004-2016            | N/A                                                            | Wiley-Blackwell                      | 1165                       | N/A               |
| 35       | Journal of Acupuncture and Tuina Science             | 16723597 (Print); 19930399 (Electronic) | Active              | 2007-ongoing         | N/A                                                            | Springer Nature Switzerland AG       | 1156                       | N/A               |
| 36       | Chinese Journal of Natural Medicines                 | 20956975 (Print); 18755364 (Electronic) | Active              | 2004-ongoing         | N/A                                                            | China Pharmaceutical University      | 1147                       | 2014             |
| 37       | European Journal of Integrative Medicine             | 18763820 (Print)                         | Active              | 2008-ongoing         | N/A                                                            | Elsevier BV                          | 1120                       | 0.974            |
| 38       | Revista Brasileira de Plantas Medicinais             | 15160572 (Print)                         | Inactive            | 1999-2016            | N/A                                                            | Fundacao do Instituto de Biociencias | 1115                       | N/A               |
| 39       | Journal of Medicinal Plants                          | 16840240 (Print)                         | Active              | 2004-ongoing         | N/A                                                            | Pishuhihshakdhi-giyahan-i darayiva farvardah ha-vi tabbii | 1090                       | N/A               |
| 40       | Phytotherapie                                         | 16248597 (Print); 17652847 (Electronic) | Active              | 2005-ongoing         | N/A                                                            | Springer Verlag                      | 1071                       | N/A               |
| 41       | African Journal of Traditional, Complementary and Alternative Medicines | 01896016 (Print)                         | Inactive            | 2006-2016 (cancelled), 2002, 1995, 1991, 1981-1978, 1973-1978, 1970 | N/A                                                      | African Networks on Ethnomedicines | 995                        | N/A               |
| 42       | Forschende Komplementarmedizin                       | 16614119 (Print); 16614127 (Electronic) | Inactive            | 2006-2016, 2002      | Formerly known as Forschende Komplementarmedizin und Klassische Naturheilkunde; not categorized as "complementary and alternative medicine" by Scopus | S. Karger AG | 990 | N/A |
| Position | Journal Name                                             | ISSN                        | Active or Inactive (as of 2020) | Coverage Period               | Title History Indication                                                                 | Publisher Name                                                                 | Number of Publications Indexed in Scopus | 2019 Impact Factor |
|----------|----------------------------------------------------------|-----------------------------|---------------------------------|------------------------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------|-------------------|
| 43       | Schweizerische Zeitschrift für GanzheitsMedizin          | 10150684 (Print)            | Inactive                        | 2002-2017                   | N/A                                                                                      | Dr. Becker & Partner AG-Verlag fuer Ganzheits Medizin                         | 934                     | N/A               |
| 44       | Homeopathy: The Journal of the Faculty of Homeopathy    | 14754916 (Print); 14764245 (Electronic) | Active                          | 1998-ongoing                | Formerly known as British Homeopathic Journal; see position #14                        | Churchill Livingstone                                                           | 934                     | N/A               |
| 45       | Journal of Ethnobiology and Ethnomedicine                | 17464269 (Print)            | Active                          | 2005-ongoing                | N/A                                                                                      | BioMed Central                                                                | 928                     | 2.264             |
| 46       | Journal of Herbs, Spices and Medicinal Plants           | 10496475 (Print); 15403580 (Electronic) | Active                          | 1992-ongoing                | N/A                                                                                      | The Haworth Herbal Press                                                      | 922                     | N/A               |
| 47       | American Journal of Acupuncture                         | 00913960 (Print)            | Inactive                        | 1975-1999                   | N/A                                                                                      | American Journal of Acupuncture                                               | 843                     | N/A               |
| 48       | Acupuncture and Electro-Therapeutics Research           | 03601293 (Print)            | Active                          | 1976-ongoing                | N/A                                                                                      | Cognizant Communication Corporation                                             | 838                     | 0.200             |
| 49       | Medical Acupuncture                                    | 19364586 (Print)            | Active                          | 2008-ongoing                | N/A                                                                                      | Mary Ann Liebert Inc.                                                          | 825                     | N/A               |
| 50       | Journal of Ginseng Research                             | 12268453 (Print); 20934947 (Electronic) | Active                          | 2010-ongoing                | N/A                                                                                      | Elsevier BV                                                                  | 770                     | 5.487             |
| 51       | Boletin Latinoamericano y del Caribe de Plantas Medicinares y Aromáticas | 07177917 (Print)            | Active                          | 2008-ongoing                | N/A                                                                                      | Universidad de Santiago de Chile                                               | 701                     | 0.819             |
| 52       | Journal of Complementary and Integrative Medicine       | 15533840 (Print)            | Active                          | 2006-ongoing                | N/A                                                                                      | Walter de Gruyter GmbH                                                       | 699                     | N/A               |
| 53       | Journal of Ayurveda and Integrative Medicine            | 09759476 (Print); 09762809 (Electronic) | Active                          | 2010-ongoing                | N/A                                                                                      | Elsevier BV                                                                  | 690                     | N/A               |
| 54       | Chinese Medicine                                        | 17498546 (Print)            | Active                          | 2006-ongoing                | N/A                                                                                      | BioMed Central                                                                | 619                     | 2.960             |
| 55       | Integrative Medicine                                    | 1546993X (Print)            | Active                          | 2013-ongoing, 2005-2010     | Formerly known as International Journal of Integrative Medicine; not categorized as "complementary and alternative medicine" by Scopus | InnoVision Communications                                                     | 611                     | N/A               |
| 56       | Alternative Medicine Review                             | 10895159 (Print)            | Inactive                        | 1996-2012                   | N/A                                                                                      | Thorne Reasearch Inc.                                                         | 587                     | N/A               |
| 57       | Journal of Traditional and Complementary Medicine       | 22254110 (Print)            | Active                          | 2011-ongoing                | N/A                                                                                      | Elsevier BV                                                                  | 562                     | N/A               |
| 58       | JAMS Journal of                                         | 20052901                   | Active                          | 2008-                          | N/A                                                                                      | Elsevier BV                                                                  | 531                     | N/A               |
Table 2 Characteristics of TCAIM Journals Indexed in Scopus (n = 143) (Continued)

| Position | Journal Name                              | ISSN                  | Active or Inactive (as of 2020) | Coverage Period     | Title History Indication                                                                 | Publisher Name                      | Number of Publications Indexed in Scopus | 2019 Impact Factor |
|----------|-------------------------------------------|-----------------------|----------------------------------|---------------------|------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------|-------------------|
| 59       | Acupuncture and Meridian Studies (Print)  | 2045709X (Print)      | Active 2011-ongoing              | Formerly known as Acupuncture and Meridian Studies                      | BioMed Central                       | 475                                    | 1.512                           |
| 60       | Chiropractic and Manual Therapies (Print) | 16159071 (Print)      | Inactive 2004-2017 (cancelled)   | N/A                  | Elsevier BV                                                                              | 470                                  | N/A (Inactive)                       |                   |
| 61       | Medicina Naturista (Print)                | 15763080 (Print)      | Active 2012-ongoing              | N/A                  | Zaragoza: Universidad de Zaragoza, Facultad de Medicina                                 | 462                                  | N/A                                   |                   |
| 62       | Journal of Chinese Medicine               | 01438042 (Print)      | Active 2016-ongoing, 2001-2013   | N/A                  | Eastland Press                                                                          | 459                                  | N/A                                   |                   |
| 63       | BMC Complementary Medicine and Therapies  | 26627671 (Electronic) | Active 2020-ongoing              | Formerly known as BMC Complementary and Alternative Medicine; see position #10 | BioMed Central Ltd.                  | 456                                    | 2.833                           |
| 64       | International Journal of Osteopathic Medicine | 17460689 (Print)     | Active 2005-ongoing              | N/A                  | Elsevier Ltd                                                                             | 454                                  | 1.208                                 |                   |
| 65       | Revista Internacional de Acupuntura      | 18878369 (Print)      | Active 2007-ongoing              | N/A                  | Elsevier BV                                                                              | 452                                  | N/A                                   |                   |
| 66       | Tropical Journal of Natural Product Research | 26160684 (Print); 26160692 (Electronic) | Active 2017-ongoing | N/A | Faculty of Pharmacy, University of Benin | 452 | N/A | |
| 67       | Nordic Journal of Music Therapy           | 08098131 (Print)      | Active 2001-ongoing              | Formerly known as Nordic Journal of Music Therapy; see position #104     | Taylor & Francis                     | 442                                    | 0.913                           |
| 68       | Chinesische Medizin (Print)                | 09302786 (Print)      | Inactive 1999-2017 (cancelled)   | N/A                  | Springer International Publishing AG                                                    | 437                                  | N/A (Inactive)                       |                   |
| 69       | International Journal of Phytomedicine    | 09750185 (Print)      | Inactive 2010-2016 (cancelled)   | N/A                  | Advanced Research Journals                                                             | 427                                  | N/A (Inactive)                       |                   |
| 70       | Revue d'Homeopathie (Print)               | 18789730 (Print)      | Active 2010-ongoing              | N/A                  | Elsevier Masson                                                                         | 416                                  | N/A                                   |                   |
| 71       | Studies on Ethno-Medicine                 | 09735070 (Print)      | Active 2009-ongoing              | N/A                  | Kamla-Raj Enterprises                                                                  | 406                                  | N/A                                   |                   |
| 72       | Journal of Herbal Medicine                | 22108033 (Print); 22108041 (Electronic) | Active 2011-ongoing | N/A | Urban und Fischer Verlag Jena                                 | 405                                  | 2.221                                 |                   |
| 73       | Journal of Biologically Active Products from Nature | 22311866 (Print); 22311874 (Electronic) | Active 2011-ongoing | N/A | Taylor and Francis Ltd. | 402 | N/A | |
| 74       | Natural Products Journal                  | 22103155 (Print); 22103163 (Electronic) | Active 2011-ongoing | N/A | Bentham Science Publishers B.V. | 395 | N/A | |
| 75       | Music Therapy Perspectives                | 07346875 (Print)      | Active 2011-ongoing              | N/A                  | Oxford University Press                                                                 | 391                                  | N/A                                   |                   |
| Position | Journal Name                                                                 | ISSN                  | Active or Inactive (as of 2020) | Coverage Period          | Title History Indication                                                                 | Publisher Name                                                                 | Number of Publications Indexed in Scopus | 2019 Impact Factor |
|----------|------------------------------------------------------------------------------|-----------------------|----------------------------------|--------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|------------------------------------------|-------------------|
| 76       | Complementary Therapies in Nursing and Midwifery                            | 13536117 (Print)      | Inactive                         | 1995-2004                | Continued as Complementary Therapies in Clinical Practice; see position #33             | Elsevier BV                                                                      | 385                        | N/A               |
| 77       | Complementary Health Practice Review                                         | 15332101 (Print)      | Inactive                         | 2007-2010, 1996-1999     | Continued as Journal of Evidence-Based Complementary and Alternative Medicine; see positions #79 and #125 | SAGE Publications Inc.                                                               | 375                        | N/A               |
| 78       | Integrative Medicine Alert                                                   | 23252812 (Print)      | Active                           | 2013-ongoing             | Formerly known as Alternative Medicine Alert; see position #99                         | American Health Consultants, Inc.                                                  | 374                        | N/A               |
| 79       | Journal of Evidence-Based Complementary and Alternative Medicine            | 21565872 (Print)      | Inactive                         | 2014-2018, 1995          | Continued as Journal of Evidence-Based Integrative Medicine; see positions #77, #125 and #136 | SAGE Publications                                                                   | 369                        | N/A               |
| 80       | Oriental Pharmacy and Experimental Medicine                                  | 15982386 (Print); 22111069 (Electronic) | Inactive                         | 2012-2019                | Continued as Advances in Traditional Medicine; see position #108                       | Springer Science + Business Media                                                  | 357                        | N/A               |
| 81       | KIM - Komplementare und Integrative Medizin, Arztezeitschrift für Naturheilverfahren | 18638678 (Print)      | Inactive                         | 2007-2009                | Formerly known as Arztezeitschrift fur Naturheilverfahren und Regulationsmedizin; see position #91 | Urban & Fischer Verlag                                                            | 336                        | N/A               |
| 82       | Complementary Medicine Research                                              | 25042092 (Print); 25042106 (Electronic) | Active                           | 2017-ongoing, 2015       | N/A                                                                                     | S. Karger AG                                                                   | 314                        | 1.089             |
| 83       | Research Journal of Medicinal Plant                                         | 18193455 (Print)      | Inactive                         | 2009-2016 (cancelled)    | N/A                                                                                     | Academic Journals Inc.                                                            | 311                        | N/A               |
| 84       | International Journal of Aromatherapy                                       | 09624562 (Print); 15322106 (Electronic) | Inactive                         | 1995-2006                | N/A                                                                                     | Essential Oil Resource Consultants                                                 | 307                        | N/A               |
| 85       | International Journal of High Dilution Research                             | 19826206 (Print)      | Active                           | 2011-ongoing             | N/A                                                                                     | Universidade Estadual Paulista - UNESP                                              | 300                        | N/A               |
| 86       | Herba Polonica                                                              | 00180599 (Print)      | Active                           | 2018-ongoing, 1973-1979  | N/A                                                                                     | Instytut Roslin i Przetworow Zielarskich                                         | 284                        | N/A               |
| 87       | Sleep and Hypnosis                                                          | 13021192 (Print)      | Active                           | 2000-ongoing             | N/A                                                                                     | Kure iletism Grubu A S                                                             | 282                        | N/A               |
| 88       | Thermology International                                                    | 1506004X (Print)      | Active                           | 2002-ongoing             | N/A                                                                                     | European Association of Thermology                                                  | 278                        | N/A               |
| 89       | Journal of the Australian Traditional-Medicine Society                      | 13263390 (Print)      | Inactive                         | 2008-2016                | N/A                                                                                     | Australian Traditional-Medicine Society                                            | 276                        | N/A               |
| 90       | Journal of Traditional Medicines                                            | 18801447 (Print); 18813747 (Electronic) | Inactive                         | 2004-2013                | N/A                                                                                     | Medical and Pharmaceutical Society for WAKA N-YAKU                                | 268                        | N/A               |
| 91       | Arztezeitschrift für Naturheilverfahren und                                 | 16148339 (Print)      | Inactive                         | 2004-2006                | Continued as KIM - Komplementare und Integrative Medizin,                              | Medizinisch Literarische Verlagsgesellschaft                                      | 266                        | N/A               |
Table 2 Characteristics of TCAIM Journals Indexed in Scopus \((n = 143)\) (Continued)

| Position | Journal Name                          | ISSN                          | Active or Inactive \(\text{(as of 2020)}\) | Coverage Period                | Title History Indication                                                                 | Publisher Name                        | Number of Publications Indexed in Scopus | 2019 Impact Factor |
|----------|--------------------------------------|-------------------------------|---------------------------------------------|--------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------|------------------------------------------|-------------------|
| 92       | Revista Medica de Homeopatia          | 18888526 (Print)              | Inactive                                    | 2008-2017                     | N/A                                                                                      | Elsevier Doyma                         | 261                        | N/A (Inactive) |
| 93       | Pharmacognosy Reviews                 | 09737847 (Print); 09762787 (Electronic) | Inactive                                    | 2009-2018 \(\text{cancelled}\) | N/A                                                                                      | Medknow Publications                   | 255                        | N/A (Inactive) |
| 94       | Advances in Integrative Medicine      | 22129588 (Print); 22129596 (Electronic) | Active                                       | 2013-ongoing                  | N/A                                                                                      | Elsevier BV                            | 254                        | N/A              |
| 95       | Journal of Chiropractic Humanities   | 15563499 (Print)              | Active                                       | 2010-ongoing                  | N/A                                                                                      | Elsevier BV                            | 247                        | N/A              |
| 96       | Asian Medicine                        | 1573420X (Print); 15734218 (Electronic) | Active                                       | 2007-ongoing                  | N/A                                                                                      | Brill                                  | 241                        | N/A              |
| 97       | Natural Solutions                     | 19408153 (Print)              | Inactive                                     | 2009-2011, 1996-1997          | N/A                                                                                      | Alternative Medicine.com               | 226                        | N/A (Inactive) |
| 98       | Spirituality in Clinical Practice     | 23264500 (Print); 23264519 (Electronic) | Active                                       | 2014-ongoing                  | N/A                                                                                      | American Psychological Association Inc.| 222                        | N/A              |
| 99       | Alternative Medicine Alert            | 1096942X (Print)              | Inactive                                     | 2009-2012                     | Continued as Integrative Medicine Alert; see position #78                               | American Health Consultants, Inc.      | 220                        | N/A (Inactive) |
| 100      | Journal of Complementary Medicine     | 14468263 (Print)              | Inactive                                     | 2008-2009                     | N/A                                                                                      | Australian Pharmaceutical Publishing Co., Ltd. | 205                        | N/A (Inactive) |
| 101      | World Journal of Traditional Chinese Medicine | 23118571 (Print); 25892894 (Electronic) | Active                                       | 2017-ongoing                  | N/A                                                                                      | Wolters Kluwer Medknow Publications    | 200                        | N/A              |
| 102      | Australian Journal of Medical Herbalism | 10338330 (Print)               | Inactive                                     | 2006-2017                     | Continued as Australian Journal of Herbal and Naturopathic Medicine; see position #130 | National Herbalists Association of Australia | 177                        | N/A (Inactive) |
| 103      | International Journal of Applied Research in Natural Products | 19406223 (Print)              | Inactive                                     | 2008-2016 \(\text{cancelled}\) | N/A                                                                                      | Healthy Synergies Publications         | 176                        | N/A (Inactive) |
| 104      | Nordisk Tidsskrift for Musikterapi    | 08039828 (Print)              | Inactive                                     | 1992-2000                     | Continued as Nordic Journal of Music Therapy; see position #67                           | Taylor and Francis Ltd.                | 175                        | N/A (Inactive) |
| 105      | Journal of Pharmacopuncture          | 20936966 (Print); 22346856 (Electronic) | Active                                       | 2016-ongoing                  | N/A                                                                                      | Korean Pharmacopuncture Institute      | 173                        | N/A              |
| 106      | European Journal of Oriental Medicine | 13516647 (Print)               | Inactive                                     | 2017, 2006-2014               | N/A                                                                                      | British Acupuncture Council            | 159                        | N/A (Inactive) |
| 107      | Phytomedia                            | 09723293 (Print)              | Inactive                                     | 1999-2006                     | Formerly known as Indian Journal of Indigenous Medicines; not categorized as "complementary and" | Scientific Publishers                 | 158                        | N/A (Inactive) |
| Position | Journal Name                                  | ISSN                              | Active or Inactive (as of 2020) | Coverage Period               | Title History Indication                                                                 | Publisher Name                              | Number of Publications Indexed in Scopus | 2019 Impact Factor |
|----------|----------------------------------------------|-----------------------------------|---------------------------------|------------------------------|------------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------------|-------------------|
| 108      | Advances in Traditional Medicine             | 26624052 (Print); 26624060 (Electronic) | Active                           | 2020-ongoing                 | Formerly known as Oriental Pharmacy and Experimental Medicine; see position #80          | Springer Singapore                         | 157                         | N/A               |
| 109      | Chiropractic Journal of Australia            | 10360913 (Print)                  | Active                           | N/A                          | Chiropractors’ Association of Australia                                                   | 151                                       | N/A                         |                   |
| 110      | Journal of Sports Chiropractic and Rehabilitation | 10841288 (Print)                  | Inactive                         | 1996-2001                    | Formerly known as Chiropractic Sports Medicine; see position #115                       | Atwood Publishing                          | 147                         | N/A (Inactive)     |
| 111      | Cannabis and Cannabinoid Research            | 23788763 (Electronic)             | Active                           | N/A                          | Mary Ann Liebert Inc.                                                                    | 147                                       | N/A                         |                   |
| 112      | Revista de Fitoterapia                       | 15760952 (Print); 19885806 (Electronic) | Active                           | N/A                          | Cita Publicaciones y Documentacion SL                                                     | 144                                       | N/A                         |                   |
| 113      | Chiropractic and Osteopathy                  | 17461340 (Print)                  | Inactive                         | 2005-2010                    | Continued as Chiropractic and Manual Therapies; see position #59                         | BioMed Central                             | 135                         | N/A (Inactive)      |
| 114      | Scientific Review of Alternative Medicine    | 10950656 (Print)                  | Inactive                         | 2000-2007                    | N/A                                                                                     | Prometheus Books Inc.                      | 134                         | N/A (Inactive)      |
| 115      | Chiropractic Sports Medicine                 | 08896976 (Print)                  | Inactive                         | 1987-1995                    | Continued as Journal of Sports Chiropractic and Rehabilitation; see position #110       | Atwood Publishing                          | 133                         | N/A (Inactive)      |
| 116      | Clinical Acupuncture and Oriental Medicine   | 14611449 (Print)                  | Inactive                         | 1999-2003                    | N/A                                                                                     | Churchill Livingstone                      | 133                         | N/A (Inactive)      |
| 117      | International Journal of Ozone Therapy       | 19723539 (Print)                  | Inactive                         | 2007-2013                    | N/A                                                                                     | Centauro SRL                               | 129                         | N/A (Inactive)      |
| 118      | Journal of the Society for Integrative Oncology | 1715894X (Print)                  | Inactive                         | 2006-2010                    | Formerly known as Journal of Cancer Integrative Medicine; see position #140             | B.C. Decker Inc.                           | 128                         | N/A (Inactive)      |
| 119      | Journal of Intercultural Ethnopharmacology   | 21468397 (Electronic)             | Inactive                         | 2016-2017 (cancelled)        | N/A                                                                                     | Ejmanager LLC                              | 122                         | N/A (Inactive)      |
| 120      | Medicina Clinica e Termale                   | 11239395 (Print)                  | Inactive                         | 2008, 2005-2006, 2001-2003, 1997-1998 | N/A                                                                                     | Tipografia la Commerciale s.r.c.            | 122                         | N/A (Inactive)      |
| 121      | Phytotherapie Europeenne                     | 16286847 (Print)                  | Inactive                         | 2007-2010                    | N/A                                                                                     | Meditions Carline                          | 121                         | N/A (Inactive)      |
| 122      | Alternative Medicine                          | 10814000 (Print)                  | Inactive                         | 2007-2008                    | N/A                                                                                     | Future Medicine Pub.                       | 119                         | N/A (Inactive)      |
| 123      | Complementary Medical Research               | 02684055 (Print)                  | Inactive                         | 1988-1992                    | Continued as Complementary Therapies in Medicine; see position #16                      | Routledge & Kegan Paul                     | 119                         | N/A (Inactive)      |
| 124      | Journal of Traditional Chinese Medical Sciences | 20957548 (Electronic)            | Active                           | 2019-ongoing                 | N/A                                                                                     | Beijing University of Chinese Medicine     | 115                         | N/A               |
| 125      | Journal of Evidence-Based Integrative Medicine | 2515690X (Electronic)            | Active                           | 2018-ongoing                 | Formerly known as Journal of Evidence-Based Complementary and Alternative               | SAGE Publications Ltd                      | 113                         | N/A               |
| Position | Journal Name | ISSN | Active or Inactive (as of 2020) | Coverage Period | Title History Indication | Publisher Name | Number of Publications Indexed in Scopus | 2019 Impact Factor |
|----------|--------------|------|---------------------------------|-----------------|--------------------------|----------------|-----------------------------------------|--------------------|
| 126      | Alternative Therapies in Womens Health | 15223396 (Print) | Inactive | 2006-2009 | N/A | American Health Consultant | 97 | N/A (Inactive) |
| 127      | Integrative Medicine Research | 22134220 (Print); 22134239 (Electronic) | Active | 2020-ongoing | N/A | Elsevier BV | 96 | 2.172 |
| 128      | Australian Journal of Acupuncture and Chinese Medicine | 18339735 (Print) | Inactive | 2016-2016, 2011-2014 | N/A | Australian Acupuncture and Chinese Medicine Association Ltd | 83 | N/A (Inactive) |
| 129      | AAO Journal | 23755776 (Print) | Active | 2006-ongoing | N/A | American Academy Of Osteopathy | 83 | N/A |
| 130      | Australian Journal of Herbal and Naturopathic Medicine | 2209119X (Print); 22091203 (Electronic) | Active | 2018-ongoing | Formerly known as Australian Journal of Medical Herbalism; see position #102 | Naturapaths and Herbalists Association of Australia | 63 | N/A |
| 131      | Indian Journal of Research in Homoeopathy | 09747168 (Print); 23207094 (Electronic) | Active | 2019-ongoing | N/A | Wolters Kluwer Medknow Publications | 61 | N/A |
| 132      | Akupunktur und Traditionelle Chinesische Medizin | 16146891 (Print) | Inactive | 2004-2006 | Formerly known as Akupunktur; not categorized as "complementary and alternative medicine" by Scopus | Medizinisch Literarische Verlagsgesellschaft mbH | 59 | N/A (Inactive) |
| 133      | Seminars in Preventive and Alternative Medicine | 15564061 (Print) | Inactive | 2005-2007 | N/A | Elsevier | 43 | N/A (Inactive) |
| 134      | Open Access Journal of Medicinal and Aromatic Plants | 09747877 (Print) | Active | 2010-ongoing | N/A | Medicinal and Aromatic Plants Association of India | 41 | N/A |
| 135      | Archives of Drug Information | 17535174 (Print) | Inactive | 2008-2011 | N/A | John Wiley & Sons Inc. | 35 | N/A (Inactive) |
| 136      | Integrative Medicine Insights | 11773936 (Print) | Inactive | 2008-2018 | Continued as Journal of Evidence-Based Integrative Medicine; see positions #79 and #125 | Libertas Academica | 33 | N/A (Inactive) |
| 137      | Evidence-Based Integrative Medicine | 11762330 (Print) | Inactive | 2005 | N/A | Adis Press | 31 | N/A (Inactive) |
| 138      | Current Traditional Medicine | 22150838 (Print); 22150846 (Electronic) | Inactive | 2015-2016 | N/A | Bentham Science Publishers B.V. | 16 | N/A (Inactive) |
| 139      | Journal of Experimental and Integrative Medicine | 13094572 (Print); 21463298 (Electronic) | Inactive | 2014-2016 | N/A | Gesdav | 16 | N/A (Inactive) |
| 140      | Journal of Cancer Integrative Medicine | 15446301 (Print) | Inactive | 2005 | Continued as Journal of the Society for Integrative Oncology; see position #118 | Prime National Publishing Corp. | 15 | N/A (Inactive) |
| 141      | International Journal of Clinical | 10471979 (Print) | Inactive | 2014-2016 | N/A | Allerton Press Inc. | 4 | N/A (Inactive) |
a co-occurrence analysis of the 500 most frequent author keywords used across all publications. In a co-occurrence analysis, the relatedness of items is determined based on the number of publications in which they occur together. From this figure, a number of clusters can be observed representing different TCAIM topics. The yellow, red and dark blue clusters represent a large network of keywords related to laboratory-based studies, while the green cluster represents keywords related to clinical research and review-type studies. The smaller light blue cluster also highlights research conducted on traditional and indigenous medicines. This figure also provides insights into some of the most highly studied diseases/conditions published in TCAIM journals, which include breast and lung cancer, diabetes, anxiety, and low back pain.

Discussion
The objective of the present bibliometric analysis is to capture the characteristics of the research literature published in TCAIM journals. The search conducted on Scopus yielded over 170,000 publications, representing the largest bibliometric analysis of TCAIM literature to date to the author's knowledge. Since the 1940s, an upward trend with respect to the volume of publications can be observed, with a steep increase observed between the mid-2000s and mid-2010s. This upward trend has continued with 2020 marking the most productive year globally to date. Unsurprisingly, therefore, the production in this body of literature follows Price's law of exponential growth, which is characteristic of fields of research which have experienced great and continued advances and interest from the international research community; other bodies of research literature that have experienced exponential growth include the topics of medical informatics [43], glaucoma [44], psychopharmacology [45], and antipsychotic drugs [46]. This growth in the volume of research published over the most recent decades can largely be explained by an increase in funding support by government and nongovernment sectors for TCAIM research [47–50]. In the present study, it was found that China was the most productive country with respect to TCAIM research at 45,860 publications, followed by the United States at 29,523 and Germany at 10,120. A vast amount of research continues to be conducted on traditional Chinese medicine in China [51–53], while the United States and Germany have both historically been the leading countries with respect to the research of various TCAIM therapies [31–34]. While the vast majority of publications were written in English, which is largely regarded as the international language of academic publication, it is also unsurprising that the second most common language was Chinese, and the third was German, as this corresponds with the national languages of the most productive countries. Of the top 20 institutional affiliations responsible for publishing this TCAIM research, 17 originated from China, with the remaining two from South Korea and one from Taiwan; a number of affiliations based in the United States and Germany existed as well, but below the top 20. Additionally, with respect to the top 20 funding sponsors, the countries with the largest number were China and the United States, with six organizations each.

In interpreting these results, the reader should be aware of a number of caveats. For example, authors who have spent more years working in research, and journals that have been publishing for a longer period of time and/or have a greater proportion of their archive indexed in Scopus, will have more publications, citations, and collaborations. Additionally, older publications will have an increased chance of receiving citations, as evidenced by only 15 of the most 100 cited articles being published since 2020. Additionally, it is worthwhile to note that while only the journal’s impact factor was reported in Table 2, other indices are increasingly being used to rank the impact of journals (and authors), such as the

| Position | Journal Name                                  | ISSN                      | Active or Inactive (as of 2020) | Coverage Period | Title History Indication                                                                 | Publisher Name                      | Number of Publications Indexed in Scopus | 2019 Impact Factor |
|----------|-----------------------------------------------|---------------------------|---------------------------------|-----------------|--------------------------------------------------------------------------------------------|-------------------------------------|----------------------------------------|-------------------|
| 142      | World Journal of Acupuncture - Moxibustion    | 10035257 (Electronic)     | Inactive                        | 2013            | N/A                                                                                        | Elsevier BV                         | 4                                      | N/A (Inactive)     |
| 143      | Journal of Orthomolecular Medicine            | 08344825 (Print)          | Inactive                        | 2017, 1988-2015 | Formerly known as Journal of Orthomolecular Psychiatry; not categorized as “complementary and alternative medicine” by Scopus | Canadian Schizophrenia Foundation  | 0                                      | N/A (Inactive)     |
Table 3 General Characteristics of Publications in TCAIM Journals

| Publication Volume         | n          | %  |
|---------------------------|------------|----|
| Number of Total Publications | 172466     | 100.0% |
| Number of Open Access Publications | 42331     | 24.5% |

| Document Type (# of publications) | n          | %  |
|-----------------------------------|------------|----|
| Article                           | 139540     | 80.9% |
| Review                            | 13418      | 7.8% |
| Note                              | 5873       | 3.4% |
| Editorial                         | 4643       | 2.7% |
| Letter                            | 3096       | 1.8% |
| Conference Paper                  | 2706       | 1.6% |
| Short Survey                      | 1774       | 1.0% |
| Erratum                           | 1293       | 0.7% |
| Retracted                         | 23         | 0.0% |
| Conference Review                 | 5          | 0.0% |
| Undefined                         | 95         | 0.1% |

| Number of Unique Authors          | n          |    |
|-----------------------------------|------------|----|
| Source Titles (Journals) Across All Publications | 144        |    |

| Subject Area of Publication (10 Highest) | (# of publications) | %  |
|-----------------------------------------|---------------------|----|
| Medicine                                | 172456              | 100.0% |
| Pharmacology, Toxicology and Pharmaceutics | 86902              | 50.4% |
| Biochemistry, Genetics and Molecular Biology | 40262              | 23.3% |
| Chemistry                               | 31845               | 18.5% |
| Agricultural and Biological Sciences    | 12124               | 7.0% |
| Health Professions                      | 11487               | 6.7% |
| Nursing                                 | 7428                | 4.3% |
| Social Sciences                         | 1949                | 1.1% |
| Mathematics                             | 1461                | 0.8% |
| Arts and Humanities                     | 1249                | 0.7% |

| Language of Publication (10 Highest)   | (# of publications) | %  |
|----------------------------------------|---------------------|----|
| English                                | 135718              | 78.7% |
| Chinese                                | 24614               | 14.3% |
| German                                 | 8611                | 5.0% |
| Spanish                                | 1741                | 1.0% |
| French                                 | 1645                | 1.0% |
| Portuguese                             | 1065                | 0.6% |
| Persian                                | 691                 | 0.4% |
| Polish                                 | 200                 | 0.1% |
| Italian                                | 162                 | 0.1% |
| Country of Publication (20 Highest) | # of publications | Percentage |
|-----------------------------------|------------------|------------|
| China                             | 45860            | 26.6%      |
| United States                     | 29523            | 17.1%      |
| Germany                           | 10120            | 5.9%       |
| India                             | 9116             | 5.3%       |
| Japan                             | 6774             | 3.9%       |
| South Korea                       | 6120             | 3.5%       |
| United Kingdom                    | 6057             | 3.5%       |
| Brazil                            | 4915             | 2.8%       |
| Australia                         | 3844             | 2.2%       |
| Taiwan                            | 3660             | 2.1%       |
| Iran                              | 3558             | 2.1%       |
| Italy                             | 3341             | 1.9%       |
| France                            | 3325             | 1.9%       |
| Canada                            | 2607             | 1.5%       |
| Spain                             | 2449             | 1.4%       |
| Switzerland                       | 2238             | 1.3%       |
| Austria                           | 1835             | 1.1%       |
| Nigeria                           | 1814             | 1.1%       |
| Malaysia                          | 1798             | 1.0%       |
| Turkey                            | 1754             | 1.0%       |

| Institutional Affiliation (20 Highest) | # of publications | Percentage |
|----------------------------------------|-------------------|------------|
| China Academy of Chinese Medical Sciences | 3560             | 2.1%       |
| Beijing University of Chinese Medicine  | 2896             | 1.7%       |
| Chinese Academy of Sciences            | 2896             | 1.7%       |
| Chinese Academy of Medical Sciences & Peking Union Medical College | 2613 | 1.5% |
| Ministry of Education China             | 2595             | 1.5%       |
| Shanghai University of Traditional Chinese Medicine | 1949 | 1.1% |
| Nanjing University of Traditional Chinese Medicine | 1868 | 1.1% |
| China Pharmaceutical University        | 1403             | 0.8%       |
| Kyung Hee University                   | 1302             | 0.8%       |
| Tianjin University of Traditional Chinese Medicine | 1171 | 0.7% |
| China Medical University Taichung      | 1165             | 0.7%       |
| Chengdu University of Traditional Chinese Medicine | 1153 | 0.7% |
| Shenyang Pharmaceutical University     | 1147             | 0.7%       |
| Guangzhou University of Chinese Medicine | 1078             | 0.6%       |
| Institute of Materia Medica, Chinese Academy of Medical Sciences & Peking Union Medical College | 1069 | 0.6% |
| Institute of Medicinal Plant Development, Chinese Academy of Medical Sciences & Peking Union Medical College | 1035 | 0.6% |
| Peking University                     | 963              | 0.6%       |
| Kunming Institute of Botany Chinese Academy of Sciences | 941 | 0.5% |
| Jiangxi University of Traditional Chinese Medicine | 853 | 0.5% |
Comparative literature

The findings from published bibliometric analyses specific to the TCAIM research literature can be compared to that of the present study. One of the first bibliometric analyses of the TCAIM research literature was published by Barnes et al. in 1999 [31]. Using a number of TCAIM-related keywords, the authors conducted searches on MEDLINE and analysed the literature published from 1966 to 1996. At the time, they reported that the volume of TCAIM publications per year rose between 1972 and 1986, and then remained stable and approximated 1500 per year up until 1996. Although in the present study a growth in the volume of literature is still observed from 1986 to 1996, the mean number of publications per year over this decade was approximately 1400, which aligns closely with the findings of the authors [31]. Fu et al. (2011) [32] analysed 17,002 publications found in 19 complementary and alternative medicine journals over approximately three decades. They found that the most productive countries included the United States, China, India, England and Germany, all of which fell within the top seven most productive countries in the present study. A number of institutions were also identified by both Fu et al. (2011) [32] as well as the present study to be among the most productive internationally, including China Medical University and Kyung Hee University. Danell et al. analysed four decades’ worth of complementary and alternative medicine publication activity from 1966 to 2007 [33], then later repeated their study again to include five decades from 1966 to 2016 [34]. In their more recent study, they analyzed 105,216 publications, which prior to the present study, was the largest bibliometric analysis on this topic. Unlike the present study which sought to characterize publications in TCAIM journals, Danell et al.’s (2020) inclusion criteria included publications that had “Complementary Therapies” as their Medical Subject Heading major topic, in the MEDLINE database [34]. Lastly, Youn et al. (2021) conducted a bibliometric analysis of the integrative medicine research literature based on a search query using two keywords joined by the Boolean operator “OR”: “complementary and integrative medicine” OR “integrative medicine”, retrieving and analysing a total of 4660 publications. Although their study's focus was on integrative medicine, a number of their findings are shared with the present study; for example, they also identified United States, China, and Germany to be the most

Table 3 General Characteristics of Publications in TCAIM Journals (Continued)

| Funding Sponsor (20 Highest) | ( # of publications) | n = 785 | 0.5% |
|-----------------------------|----------------------|---------|------|
| National Natural Science Foundation of China | | 5711 | 3.3% |
| National Institutes of Health | | 4055 | 2.4% |
| US Department of Health and Human Services | | 4032 | 2.3% |
| National Cancer Institute | | 1477 | 0.9% |
| Ministry of Education, Culture, Sports, Science and Technology | | 1057 | 0.6% |
| Ministry of Science and Technology of the People's Republic of China | | 979 | 0.6% |
| National Research Foundation of Korea | | 944 | 0.5% |
| National Center for Complementary and Integrative Health | | 932 | 0.5% |
| Japan Society for the Promotion of Science | | 903 | 0.5% |
| Ministry of Education of the People's Republic of China | | 749 | 0.4% |
| Conselho Nacional de Desenvolvimento Científico e Tecnológico | | 694 | 0.4% |
| Ministério da Ciência, Tecnologia e Inovações | | 574 | 0.3% |
| Coordenação de Aperfeicooamento de Pessoal de Nivel Superior | | 527 | 0.3% |
| National Institute of General Medical Sciences | | 442 | 0.3% |
| National Center for Research Resources | | 427 | 0.3% |
| National Key Research and Development Program of China | | 397 | 0.2% |
| Ministry of Science, ICT and Future Planning | | 353 | 0.2% |
| Fundamental Research Funds for the Central Universities | | 323 | 0.2% |
| European Commission | | 309 | 0.2% |
| Chinese Academy of Sciences | | 293 | 0.2% |

H-index and SJR ranking, and differences may be observed based on the metric used.
| Position | Author Name     | Number of Publications | Author H-Index |
|----------|----------------|------------------------|----------------|
| 1        | Huang, L.Q.     | 330                    | 42             |
| 2        | Goetz, P.       | 314                    | 5              |
| 3        | Ernst, E.       | 311                    | 106            |
| 4        | Xie, Y.M.       | 264                    | 14             |
| 5        | Lee, M.S.       | 232                    | 47             |
| 6        | Tu, P.F.        | 231                    | 48             |
| 7        | Pezzuto, J.M.   | 223                    | 88             |
| 8        | Jia, X.B.       | 213                    | 33             |
| 9        | Kinghorn, A.D.  | 207                    | 72             |
| 10       | Cordell, G.A.   | 205                    | 61             |
| 11       | Guo, L.P.       | 186                    | 23             |
| 12       | Yang, M.        | 186                    | 18             |
| 13       | Dossey, L.      | 179                    | 12             |
| 14       | Wang, Z.Z.      | 176                    | 27             |
| 15       | Kingston, D.G.I.| 170                    | 60             |
| 16       | Yao, X.S.       | 169                    | 51             |
| 17       | Khan, I.A.      | 168                    | 60             |
| 18       | Farnsworth, N.R.| 167                    | 66             |
| 19       | White, A.       | 167                    | 56             |
| 20       | Hostettmann, K. | 166                    | 63             |
| 21       | Schulz, V.      | 162                    | 9              |
| 22       | Hamburger, M.   | 161                    | 46             |
| 23       | Qin, X.M.       | 161                    | 27             |
| 24       | Allen, T.W.     | 160                    | 4              |
| 25       | Donnelly, G.F.  | 160                    | 5              |
| 26       | Sun, H.D.       | 156                    | 50             |
| 27       | Duan, J.A.      | 153                    | 44             |
| 28       | Proksch, P.     | 152                    | 65             |
| 29       | Wu, Y.C.        | 152                    | 56             |
| 30       | Guo, Q.S.       | 151                    | 18             |
| 31       | Setzer, W.N.    | 146                    | 43             |
| 32       | Adams, J.       | 145                    | 38             |
| 33       | Efferth, T.     | 145                    | 75             |
| 34       | Ammer, K.       | 140                    | 16             |
| 35       | Ye, W.C.        | 140                    | 42             |
| 36       | Zhang, T.J.     | 140                    | 15             |
| 37       | Bauer, R.       | 137                    | 51             |
| 38       | Yang, S.L.      | 136                    | 26             |
| 39       | Hart, J.        | 134                    | 5              |
| 40       | Lee, K.H.       | 134                    | 80             |
| 41       | Sticher, O.     | 134                    | 50             |
| 42       | Yarnell, E.     | 134                    | 13             |
| 43       | Pettit, G.R.    | 133                    | 89             |
| 44       | Uehleke, B.     | 133                    | 16             |
| Position | Author Name          | Number of Publications | Author H-Index |
|----------|---------------------|------------------------|----------------|
| 45       | Yang, X.W.          | 131                    | 31             |
| 46       | Chen, S.L.          | 130                    | 57             |
| 47       | Wang, Z.M.          | 128                    | 18             |
| 48       | Xiao, X.H.          | 127                    | 38             |
| 49       | Lin, J.G.           | 126                    | 46             |
| 50       | Beyen, L.           | 124                    | 6              |
| 51       | Kiefer, D.          | 124                    | 7              |
| 52       | Choudhary, M.I.     | 122                    | 57             |
| 53       | Pieters, L.         | 122                    | 58             |
| 54       | Chen, R.Y.          | 120                    | 57             |
| 55       | Robinson, N.        | 120                    | 33             |
| 56       | Verpoorte, R.       | 119                    | 86             |
| 57       | Liao, X.            | 118                    | 11             |
| 58       | Zhang, W.D.         | 116                    | 46             |
| 59       | Hao, X.J.           | 115                    | 42             |
| 60       | Block, K.I.         | 114                    | 17             |
| 61       | Kraft, K.           | 114                    | 9              |
| 62       | Liebenson, C.       | 114                    | 9              |
| 63       | Kadota, S.          | 112                    | 66             |
| 64       | Lao, L.             | 112                    | 50             |
| 65       | Litscher, G.        | 112                    | 29             |
| 66       | Wagner, H.          | 112                    | 49             |
| 67       | Niemtzow, R.C.      | 111                    | 14             |
| 68       | Yu, D.Q.            | 111                    | 28             |
| 69       | Fisher, P.          | 110                    | 26             |
| 70       | Kong, L.Y.          | 110                    | 47             |
| 71       | Omura, Y.           | 110                    | 17             |
| 72       | McLaughlin, J.L.    | 108                    | 55             |
| 73       | Tezuka, Y.          | 108                    | 61             |
| 74       | Chang, F.R.         | 107                    | 54             |
| 75       | Fong, H.H.S.        | 106                    | 55             |
| 76       | Gibson, D.M.        | 106                    | 1              |
| 77       | Cramer, H.          | 105                    | 41             |
| 78       | Yuan, Y.            | 105                    | 16             |
| 79       | Horowitz, S.        | 104                    | 7              |
| 80       | Walach, H.          | 104                    | 40             |
| 81       | Gerwick, W.H.       | 103                    | 73             |
| 82       | Wright, A.D.        | 103                    | 49             |
| 83       | Naghdi Badi, H.     | 102                    | 18             |
| 84       | Qian, J.W.          | 102                    | 31             |
| 85       | Kuo, Y.H.           | 101                    | 53             |
| 86       | Schwartz, S.A.      | 101                    | 7              |
| 87       | Dai, H.F.           | 100                    | 31             |
| 88       | Guo, D.A.           | 100                    | 56             |
productive countries (albeit in this order), and they also found that cancer was one of the most commonly studied diseases/conditions [35]. In line with the findings made by Barnes et al. (1999) [31], Danell et al. (2009) [33], Fu et al. (2011) [32], Danell et al. (2020) [34], and Youn et al. (2021) [35], the present study also found an upward trend with respect to the volume of TCAIM research being published each year over the past decades. With respect to the number of publications captured, although Danell et al.’s (2020) study was published in 2020, their coverage of the TCAIM literature only extended up until 2016 [34]. In the present study, over 37,000 publications were found to be published between 2017 and April 2021, comprising over 20% of the entire body of literature analysed.

Future directions
Beyond the aforementioned comparative literature, it is worth noting that it has been far more common for bibliometric analyses to be conducted on a specific TCAIM-related topic. These have included acupuncture [54–56], aromatherapy [57], apitherapy [58], complementary and integrative oncology [59], ethnopharmacology [60], homeopathy [61], medicinal plants [62], qi gong [63], and yoga [64, 65], as just some examples among others. Others have conducted bibliometric analyses specific to methodologies, such as clinical trials [64, 66, 67] or guidelines [55] in TCAIM. Bibliometric analyses of the TCAIM literature with specific sub-topics are more straightforward to conduct, as the keywords and searches applied are likewise also easier to standardize. One of the main challenges in conducting comprehensive bibliometric analyses of the TCAIM literature in its entirety is the fact that it is very difficult to operationalize a dynamic and unrelated group of therapies that have been defined on the basis that they lie outside of the purview of conventional Western medical care [68, 69]. As a result, all of the bibliometric analyses of the TCAIM literature to date have been based on searches of TCAIM-specific journals or TCAIM-specific indexed headings, both of which unquestionably provide an incomplete picture of all the TCAIM literature. Thus, future directions of value include 1) the creation of an operational definition of TCAIM informed by a systematic search strategy, and 2) the development of standardized search strategies for major academic databases based on this operational definition.

Strengths and limitations
This present bibliometric study captured and analysed the characteristics of over 170,000 publications, making it the largest conducted to date with respect to the TCAIM literature, and the most comprehensive with regards to TCAIM journal inclusion. Searches were conducted on Scopus as this academic database has a larger coverage in comparison to other databases such as Web of Science. Despite this, it must be acknowledged that all academic databases contain gaps in their indexing, and this was realized at the point of analysis in the present study. Publication data collected from Scopus was not externally verified against another source, and it is also important to note that the number of publications reflect what was indexed by the database as of the search date, and not necessarily the true number of publications published by the included journals themselves. It should be noted that publications included in this bibliometric analysis were based on the fact that they were published in a journal belonging to the “complementary and alternative medicine” category (code 2707), identified based on the ASJC provided by Scopus; as evidenced by Table 4

Table 4 100 Most Productive Authors Across Publications in TCAIM Journals (Continued)

| Position | Author Name    | Number of Publications | Author H-Index |
|----------|----------------|------------------------|----------------|
| 89       | Hsieh, C.L.    | 100                    | 36             |
| 90       | Xiao, P.G.     | 100                    | 42             |
| 91       | Li, P.         | 99                     | 56             |
| 92       | Morita, H.     | 99                     | 52             |
| 93       | De Tommasi, N. | 98                     | 39             |
| 94       | Ots, T.        | 98                     | 4              |
| 95       | Tokuda, H.     | 97                     | 68             |
| 96       | Weeks, J.      | 97                     | 8              |
| 97       | Witt, C.M.     | 97                     | 42             |
| 98       | Saller, R.     | 96                     | 33             |
| 99       | Steel, A.      | 96                     | 22             |
| 100      | König, G.M.    | 95 (tied for 100th place) | 54             |
| 101      | Xiao, W.       | 95 (tied for 100th place) | 14             |

Ng BMC Complementary Medicine and Therapies (2021) 21:185 Page 20 of 31
| Position | Title                                                                 | Authors                                  | Year | Source Title               | Citation Count |
|----------|----------------------------------------------------------------------|------------------------------------------|------|---------------------------|----------------|
| 1        | Natural products as sources of new drugs over the last 25 years      | Newman D.J., Cragg G.M.                  | 2007 | Journal of Natural Products | 3258           |
| 2        | Flavonoids as antioxidants                                           | Pietta P.-G.                             | 2000 | Journal of Natural Products | 3162           |
| 3        | Natural products as sources of new drugs over the 30 years from 1981 to 2010 | Newman D.J., Cragg G.M.                  | 2012 | Journal of Natural Products | 3122           |
| 4        | Brine shrimp: A convenient general bioassay for active plant constituents | Meyer B.N., Ferrigni N.R., Putnam J.E., Jacobsen L.B., Nichols D.E., McLaughlin J.L. | 1982 | Planta Medica                     | 2939           |
| 5        | Natural products as sources of new drugs from 1981 to 2014           | Newman D.J., Cragg G.M.                  | 2016 | Journal of Natural Products | 2750           |
| 6        | Natural products as sources of new drugs over the period 1981–2002   | Newman D.J., Cragg G.M., Snader K.M.     | 2003 | Journal of Natural Products | 2285           |
| 7        | Free radicals, antioxidants and functional foods: Impact on human health | Lobo V., Patil A., Phatak A., Chandra N. | 2010 | Pharmacognosy Reviews                   | 1939           |
| 8        | Pharmacology of Curcuma longa                                        | Ammon H.P.T., Wahl M.A.                  | 1991 | Planta Medica                     | 1415           |
| 9        | A sensitive and quick microplate method to determine the minimal inhibitory concentration of plant extracts for bacteria | Eloff J.N.                             | 1998 | Planta Medica                     | 1320           |
| 10       | Screening of plant extracts for antioxidant activity: A comparative study on three testing methods | Koleva I.I., Van Beek T.A., Linsen J.P.H., De Groot A., Evstatieva L.N. | 2002 | Phytochemical Analysis             | 1186           |
| 11       | Influence of piperine on the pharmacokinetics of curcumin in animals and human volunteers | Shoba G., Joy D., Joseph T., Majeed M., Rajendran R., Srinivas P.S.S.R. | 1998 | Planta Medica                     | 1178           |
| 12       | Natural products in drug discovery and development                   | Cragg G.M., Newman D.J., Snader K.M.     | 1997 | Journal of Natural Products       | 1126           |
| 13       | Natural polyphenols (vegetable tannins) as drugs: Possible modes of action | Haslam E.                             | 1996 | Journal of Natural Products       | 960            |
| 14       | Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement (Chinese edition) | Moher D., Liberati A., Tetzlaff J., Altman D.G., Altman D., Antes G., Atkins D., Barbour V., Barrowman N., Berlin J.A., Clark J., Clarke M., Cook D., D’Armino R., Deeks J.J., Devereaux P.J., Dickerson K., Egger M., Ernst E., Gøtzsche P.C., Grimshaw J., Guyatt G., Higgins J., Ioannidis J.P.A., Kleijnen J., Lang T., Magrini N., McNamee D., Moja L., Mulrow C., Napoli M., Oxman A., Pham B., Rennie D., Sampson M., Schulz K.F., Shekelle P.G., Tovey D., Tugwell P. | 2009 | Journal of Chinese Integrative Medicine | 933            |
| 15       | The role of natural product chemistry in drug discovery                | Butler M.S.                             | 2004 | Journal of Natural Products       | 918            |
| 16       | Natural products from endophytic microorganisms                       | Strobel G., Daisy B., Castillo U., Harper J. | 2004 | Journal of Natural Products       | 916            |
| 17       | Anti-inflammatory properties of curcumin, a major constituent of Curcuma longa: A review of preclinical and clinical research | Jurenka J.S.                             | 2009 | Alternative Medicine Review       | 837            |
| 18       | Dose escalation of a curcuminoid formulation                          | Lao C.D., Ruffin IV M.T., Normolle D., Heath D.D., Murray S.L., Bailey J.M., Boggs M.E., Crowell J., Rock C.L., Brenner D.E. | 2006 | BMC Complementary and Alternative Medicine | 833            |
| 19       | Structure-activity relationship and classification of flavonoids as inhibitors of xanthine oxidase and superoxide scavengers | Cos P., Ying L., Calomme M., Hu J.P., Cimanga K., Van Poel B., Pieters L., Viettink A.J., Vanden Berghe D. | 1998 | Journal of Natural Products       | 823            |
| 20       | Mindfulness-based stress reduction for stress management in healthy people: A review and meta-analysis | Chiesa A., Serretti A.                   | 2009 | Journal of Alternative and Complementary Medicine | 789            |
| 21       | Th1/Th2 balance: The hypothesis, its limitations, and implications for health and disease | Kidd P.                             | 2003 | Alternative Medicine Review       | 781            |
| Position | Title                                                                 | Authors                                         | Year | Source Title                              | Citation Count |
|----------|----------------------------------------------------------------------|-------------------------------------------------|------|-------------------------------------------|----------------|
| 22       | Annonaceous acetogenins: Recent progress                             | Alali F.Q., Liu X.-X., McLaughlin J.L.          | 1999 | Journal of Natural Products               | 745            |
| 23       | Antidiabetic plants and their active constituents                    | Marles R.J., Farnsworth N.R.                   | 1995 | Phytomedicine                             | 744            |
| 24       | Trends in use of complementary and alternative medicine by us adults: 1997–2002 | Tindle H.A., Davis R.B., Phillips R.S., Eisenberg D.M. | 2005 | Alternative Therapies in Health and Medicine | 724            |
| 25       | Antioxidant principles from Bauhinia tarapotensis                    | Braca A., De Tommasi N., Di Bari L., Pizza C., Politi M., Morelli I. | 2001 | Journal of Natural Products               | 712            |
| 26       | Synergy research: Approaching a new generation of phytopharmaceuticals | Wagner H., Ulrich-Merzenich G.                 | 2009 | Phytomedicine                             | 695            |
| 27       | Safety and anti-inflammatory activity of curcumin: A component of turmeric (Curcuma longa) | Chainani-Wu N.                                    | 2003 | Journal of Alternative and Complementary Medicine | 683            |
| 28       | Natural products from plant-associated microorganisms: Distribution, structural diversity, bio-activity, and implications of their occurrence | Gunatiilaka A.A.L.                                | 2006 | Journal of Natural Products               | 664            |
| 29       | The pharmacological potential of mushrooms                           | Lindequist U., Niedermeyer T.H.J., Jülch W.-D. | 2005 | Evidence-based Complementary and Alternative Medicine | 648            |
| 30       | Fixed oil of Nigella sativa and derived thymoquinone inhibit eicosanoid generation in leukocytes and membrane lipid peroxidation | Houghton P.J., Zarka R., De Las Heras B., Houl J.R.S. | 1995 | Planta Medica                             | 641            |
| 31       | Marine natural products and related compounds in clinical and advanced preclinical trials | Newman D.J., Cragg G.M.                        | 2004 | Journal of Natural Products               | 626            |
| 32       | Synergy and other interactions in phytotherapeutics                  | Williamson E.M.                                 | 2001 | Phytomedicine                             | 621            |
| 33       | Nrf2 as a master redox switch in turning on the cellular signaling involved in the induction of cytoprotective genes by some chemopreventive phytochemicals | Surh Y.-J., Kundu JK, Na H.-K.                   | 2008 | Planta Medica                             | 593            |
| 34       | Use and expenditure on complementary medicine in England: A population based survey | Thomas K.J., Nicholl J.P., Coleman P.            | 2001 | Complementary Therapies in Medicine       | 577            |
| 35       | In vitro antibacterial activity of some plant essential oils         | Prabuseenivasan S., Jayakumar M., Ignacimuthu S. | 2006 | BMC Complementary and Alternative Medicine | 572            |
| 36       | Antioxidant and antiinflammatory activities of anthocyanins and their aglycon, cyanidin, from tart cherries | Wang H., Nair M.G., Strasburg G.M., Chang Y.-C., Booren A.M., Gray J.I., DelWitt D.L. | 1999 | Journal of Natural Products               | 572            |
| 37       | Alkaloids from amphibian skin: A tabulation of over eight-hundred compounds | Daly J.W., Spande T.F., Garaffo H.M.           | 2005 | Journal of Natural Products               | 558            |
| 38       | Scientific basis for the therapeutic use of Withania somnifera (ashwagandha): A review | Mishra L.-C., Singh B.B., Dagenais S.           | 2000 | Alternative Medicine Review               | 538            |
| 39       | Acetylcholinesterase inhibitors from plants                          | Mukherjee P.K., Kumar V., Mal M., Houghton P.J. | 2007 | Phytomedicine                             | 522            |
| 40       | Extraction, isolation and characterization of bioactive compounds from plants' extracts | Sasidharan S., Chen Y., Saravanan D., Sundram KM, Yoga Latha L. | 2011 | African Journal of Traditional, Complementary and Alternative Medicines | 514            |
| 41       | Annonaceous acetogenins: A review                                    | Rupprecht JK, Hui Y.-H., McLaughlin J.L.       | 1990 | Journal of Natural Products               | 498            |
| 42       | Synergism between natural products and antibiotics against infectious diseases | Hemaiswarya S., Kurthiventi A.K., Doble M.       | 2008 | Phytomedicine                             | 489            |
| 43       | Lead toxicity, a review of the literature. Part I                    | Patrick L.                                     | 2006 | Alternative Medicine                      | 481            |
| Position | Title                                                                 | Authors                                                                                     | Year  | Source Title                          | Citation Count |
|----------|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-------|---------------------------------------|----------------|
| 44       | Complementary and alternative medicine use in Australia: A national population-based survey | Xue C.C.L., Zhang A.L., Lin V., Da Costa C., Story D.F.                                                                 | 2007  | Journal of Alternative and Complementary Medicine | 460            |
| 45       | Traditional Chinese medicine network pharmacology: Theory, methodology and application | Li S., Zhang B.                                                                                       | 2013  | Chinese Journal of Natural Medicines    | 455            |
| 46       | Beneficial effects of green tea: A literature review                  | Chacko S.M., Thambi P.T., Kuttan R., Nishigaki I.                                                  | 2010  | Chinese Medicine                       | 454            |
| 47       | Therapeutic applications of pomegranate (*Punica granatum* L.): A review | Jurenka J.                                                                                           | 2008  | Alternative Medicine Review            | 451            |
| 48       | Recent extraction techniques for natural products: Microwave-assisted extraction and pressurised solvent extraction | Kaufmann B., Christen P.                                                                           | 2002  | Phytochemical Analysis                 | 447            |
| 49       | Astaxanthin, a carotenoid with potential in human health and nutrition | Hussein G., Sankawa U., Goto H., Matsumoto K., Watanabe H.                                          | 2006  | Journal of Natural Products            | 429            |
| 50       | Antimicrobial activity of essential oils: A 1976–1986 literature review. Aspects of the test methods | Janssen A.M., Scheffer J.J.C., Baerheim Svendsen A.                                                | 1987  | Planta Medica                          | 429            |
| 51       | Antioxidant activity, total phenolic and total flavonoid contents of whole plant extracts *Torilis leptophylla* L. | Saeed N., Khan M.R., Shabbir M.                                                                     | 2012  | BMC Complementary and Alternative Medicine | 426            |
| 52       | Clinical applications of N-acetylcysteine                            | Kelly G.S.                                                                                         | 1998  | Alternative Medicine Review            | 422            |
| 53       | Nutritional quality of organic versus conventional fruits, vegetables, and grains | Worthington V.                                                                                     | 2001  | Journal of Alternative and Complementary Medicine | 421            |
| 54       | Chemotherapy-associated oxidative stress: Impact on chemotherapeutic effectiveness | Conklin K.A.                                                                                      | 2004  | Integrative Cancer Therapies           | 419            |
| 55       | Iridoids. A review                                                   | El-Naggar L.J., Beal J.L.                                                                         | 1980  | Journal of Natural Products            | 418            |
| 56       | Anti-aids agents, 11. Betulinic acid and platanic acid as anti-HIV principles from *Syzigium claviflorum*, and the anti-HIV activity of structurally related triterpenoids | Fujioka T., Kashiwada Y., Kilkuskie R.E., Cosentino L.M., Biales L.M., Jiang J.B., Janzen W.P., Chen L-S., Lee K-H. | 1994  | Journal of Natural Products            | 415            |
| 57       | Bleomycin: New perspectives on the mechanism of action                | Hecht S.M.                                                                                         | 2000  | Journal of Natural Products            | 406            |
| 58       | Plant-derived leading compounds for chemotherapy of human immunodeficiency virus (HIV) infection | Vlietinck A.J., De Bruyne T., Apers S., Pieters L.A.                                              | 1998  | Planta Medica                          | 404            |
| 59       | Antioxidants and cancer III: Quercetin                               | Lamson D.W., Brignall M.S.                                                                         | 2000  | Alternative Medicine Review            | 403            |
| 60       | A microwell cytotoxicity assay using *Artemia salina* (brine shrimp) | Solis P.N., Wright C.W., Anderson M.M., Gupta M.P., Phillipson J.D.                               | 1993  | Planta Medica                          | 403            |
| 61       | How many cancer patients use complementary and alternative medicine: A systematic review and metaanalysis | Horneber M., Bueschel G., Dennert G., Less D., Ritter E., Zwahlen M.                               | 2012  | Integrative Cancer Therapies           | 395            |
| 62       | The BBC survey of complementary medicine use in the UK                 | Ernst E., White A.                                                                                 | 2000  | Complementary Therapies in Medicine    | 395            |
| 63       | The scientific rediscovery of an ancient Chinese herbal medicine: *Cordyceps sinensis* part I | Zhu J.-S., Halpern G.M., Jones K.                                                                  | 1998  | Journal of Alternative and Complementary Medicine | 389            |
| 64       | Therapeutic applications of whey protein                              | Marshall K.                                                                                        | 2004  | Alternative Medicine Review            | 383            |
| 65       | Chemical toxins: A hypothesis to explain the                         | Baillie-Hamilton P.F.                                                                             | 2002  | Journal of Alternative Medicine        | 377            |
| Position | Title | Authors | Year | Source Title | Citation Count |
|----------|-------|---------|------|--------------|----------------|
| 66       | Quantitative 1H NMR: Development and potential of a method for natural products analysis | Pauli G.F., Jaki B.U., Lankin D.C. | 2005 | Journal of Natural Products | 376 |
| 67       | Antimicrobial activity of some ethnomedicinal plants used by Paliyar tribe from Tamil Nadu, India | Duraipandiyan V., Ayyanar M., Ignacimuthu S. | 2006 | BMC Complementary and Alternative Medicine | 375 |
| 68       | Goji (Lycium barbarum and L. chinense): Phytochemistry, pharmacology and safety in the perspective of traditional uses and recent popularity | Potterat O. | 2010 | Planta Medica | 374 |
| 69       | Constituents of Cannabis sativa L. XVII. a review of the natural constituents | Turner C.E., Elshohy M.A., Boeren E.G. | 1980 | Journal of Natural Products | 373 |
| 70       | Recent natural products based drug development: A pharmaceutical industry perspective | Shu Y.-Z. | 1998 | Journal of Natural Products | 371 |
| 71       | Cyclooxygenase inhibitory and antioxidant cyanidin glycosides in cherries and berries | Seeram N.P., Momin R.A., Nair M.G., Bourquin L.D. | 2001 | Phytomedicine | 370 |
| 72       | Zingiberis rhizoma: A comprehensive review on the ginger effect and efficacy profiles | Chrubasik S., Pittler M.H., Roufogalis B.D. | 2005 | Phytomedicine | 368 |
| 73       | Ayurveda and traditional Chinese medicine: A comparative overview | Patwardhan B., Warude D., Pushpangadan P., Bhatt N. | 2005 | Evidence-based Complementary and Alternative Medicine | 366 |
| 74       | A-type proanthocyanidin trimers from cranberry that inhibit adherence of uropathogenic P-fimbriated Escherichia coli | Foo L.Y., Lu Y., Howell A.B., Vorsa N. | 2000 | Journal of Natural Products | 366 |
| 75       | Historical review of medicinal plants’ usage | Petrovska B.B. | 2012 | Pharmacognosy Reviews | 363 |
| 76       | Plant sources of hepatotoxic pyrrolizidine alkaloids | Smith L.W., Culvenor C.C.J. | 1981 | Journal of Natural Products | 361 |
| 77       | Steaming of ginseng at high temperature enhances biological activity | Wang Yu Kim, Jong Moon Kim, Sang Beom Han, Seung Ki Lee, Nak Doo Kim, Park M.K., Chong Kook Kim, Park J.H. | 2000 | Journal of Natural Products | 360 |
| 78       | Recent trends and important developments in propolis research | Bankova V. | 2005 | Evidence-based Complementary and Alternative Medicine | 357 |
| 79       | Therapeutic applications of fenugreek | Basch E., Ulbricht C., Kuo G., Szapary P., Smith M. | 2003 | Alternative Medicine Review | 357 |
| 80       | Antioxidant and free radical scavenging activity of Spondias pinnata | Hazra B., Biswas S., Mandal N. | 2008 | BMC Complementary and Alternative Medicine | 354 |
| 81       | Antioxidant and radical scavenging effects of aged garlic extract and its constituents | Imai J., Ide N., Nagae S., Moriguchi T., Matsuura H., Itakura Y. | 1994 | Planta Medica | 350 |
| 82       | Pentacyclic triterpenes of the lupane, oleanean and ursane group as tools in cancer therapy | Laszczyk M.N. | 2009 | Planta Medica | 346 |
| 83       | Antioxidant and antimicrobial activity of Foeniculum vulgare and crithmum maritimum essential oils | Ruberto G., Baratta M.T., Deans S.G., Dorman H.J.D. | 2000 | Planta Medica | 346 |
| 84       | Medicinal plants used by traditional healers in Kancheepuram District of Tamil Nadu, India | Muthu C., Ayyanar M., Raja N., Ignacimuthu S. | 2006 | Journal of Ethnobiology and Ethnomedicine | 344 |
| 85       | Lead toxicity part II: The role of free radical damage and the use of antioxidants in the pathology and treatment of lead toxicity | Patrick L. | 2006 | Alternative Medicine Review | 343 |
| 86       | A rapid and effective method for RNA | Gambino G., Perrone I., Gribaudo I. | 2008 | Phytochemical Analysis | 341 |
Table 5 100 Highest-Cited Publications in TCAIM Journals (Continued)

| Position | Title                                                                 | Authors                                        | Year | Source Title                          | Citation Count |
|----------|----------------------------------------------------------------------|-----------------------------------------------|------|--------------------------------------|----------------|
| 87       | Benefits and requirements of vitamin D for optimal health: A review  | Grant W.B., Holick M.F.                       | 2005 | Alternative Medicine Review           | 341            |
| 88       | Antimicrobial and antioxidant activities of three Mentha species essential oils | Mimica-Dukić N., Božin B., Soković M., Mihajlović B., Matavulj M. | 2003 | Planta Medica                        | 338            |
| 89       | The taxane diterpenoids                                              | Baloglu E., Kingston D.G.I.                   | 1999 | Journal of Natural Products          | 337            |
| 90       | Flavonoids: A versatile source of anticancer drugs                   | Chahar M.K., Sharma N., Dobhal M.P., Joshi Y.C. | 2011 | Pharmacognosy Reviews                | 332            |
| 91       | Resilience: A historical review of the construct                     | Tusaie K., Dyer J.                            | 2004 | Holistic Nursing Practice            | 332            |
| 92       | α-glucosidase inhibitors from plants: A natural approach to treat diabetes | Kumar S., Narwal S., Kumar V., Prakash O.     | 2011 | Pharmacognosy Reviews                | 331            |
| 93       | Flavonoids from *Hypericum perforatum* show antidepressant activity in the forced swimming test | Butterweck V., Jürgenliemk G., Nahrstedt A., Winterhoff H. | 2000 | Planta Medica                        | 328            |
| 94       | Stigmasterols from *Typha latifolia*                                 | Greca M.D., Monaco P., Preverira L.           | 1990 | Journal of Natural Products          | 327            |
| 95       | Flavonoids and phenolic acids: Role and biochemical activity in plants and human | Ghasemzadeh A., Ghasemzadeh N.               | 2011 | Journal of Medicinal Plant Research  | 326            |
| 96       | Alternative antimicrobial approach: Nano-antimicrobial materials     | Beyth N., Houri-Haddad Y., Domb A., Khan W., Hazani R. | 2015 | Evidence-based Complementary and Alternative Medicine | 324            |
| 97       | Anti-inflammatory activity of linalool and linalyl acetate constituents of essential oils | Peana A.T., D’Aquila P.S., Panin F., Serra G., Pippia P., Moretti M.D.L. | 2002 | Phytomedicine                        | 324            |
| 98       | Immunostimulant agents from *Andrographis paniculata*                | Puri A., Saxena R., Saxena R.P., Saxena K.C., Srivastava V., Tandon J.S. | 1993 | Journal of Natural Products          | 324            |
| 99       | The health benefits of yoga and exercise: A review of comparison studies | Ross A., Thomas S.                           | 2010 | Journal of Alternative and Complementary Medicine | 320            |
| 100      | Anti-inflammatory compounds of plant origin. Part II. Modulation of pro-inflammatory cytokines, chemokines and adhesion molecules | Calixto J.B., Campos M.M., Otuki M.F., Santos A.R.S. | 2004 | Planta Medica                        | 319            |
Table 6  Relative Growth Rates and Doubling Times

| Year | Number of Publications | Cumulative Total | $W_1$ | $W_2$ | Relative Growth Rate | Doubling Time |
|------|------------------------|------------------|-------|-------|----------------------|--------------|
| 1938 | 13                     | 13               | –     | 2.57  | –                    | –            |
| 1939 | 10                     | 23               | 2.57  | 3.14  | 0.57                 | 1.21         |
| 1940 | 12                     | 35               | 3.14  | 3.56  | 0.42                 | 1.65         |
| 1941 | 14                     | 49               | 3.56  | 3.89  | 0.34                 | 2.06         |
| 1942 | 12                     | 61               | 3.89  | 4.11  | 0.22                 | 3.16         |
| 1943 | 16                     | 77               | 4.11  | 4.34  | 0.23                 | 2.97         |
| 1944 | 12                     | 89               | 4.34  | 4.49  | 0.14                 | 4.78         |
| 1945 | 52                     | 141              | 4.49  | 4.95  | 0.46                 | 1.51         |
| 1946 | 134                    | 275              | 4.95  | 5.62  | 0.67                 | 1.04         |
| 1947 | 162                    | 437              | 5.62  | 6.08  | 0.46                 | 1.50         |
| 1948 | 125                    | 562              | 6.08  | 6.33  | 0.25                 | 2.75         |
| 1949 | 93                     | 655              | 6.33  | 6.49  | 0.15                 | 4.52         |
| 1950 | 170                    | 825              | 6.49  | 6.72  | 0.23                 | 3.00         |
| 1951 | 153                    | 978              | 6.72  | 6.89  | 0.17                 | 4.07         |
| 1952 | 167                    | 1145             | 6.89  | 7.04  | 0.16                 | 4.40         |
| 1953 | 164                    | 1309             | 7.04  | 7.18  | 0.13                 | 5.18         |
| 1954 | 132                    | 1441             | 7.18  | 7.27  | 0.10                 | 7.21         |
| 1955 | 142                    | 1583             | 7.27  | 7.37  | 0.09                 | 7.37         |
| 1956 | 159                    | 1742             | 7.37  | 7.46  | 0.10                 | 7.24         |
| 1957 | 181                    | 1923             | 7.46  | 7.56  | 0.10                 | 7.01         |
| 1958 | 180                    | 2103             | 7.56  | 7.65  | 0.09                 | 7.74         |
| 1959 | 190                    | 2293             | 7.65  | 7.74  | 0.09                 | 8.01         |
| 1960 | 197                    | 2490             | 7.74  | 7.82  | 0.08                 | 8.41         |
| 1961 | 248                    | 2738             | 7.82  | 7.92  | 0.09                 | 7.30         |
| 1962 | 274                    | 3012             | 7.92  | 8.01  | 0.10                 | 7.27         |
| 1963 | 251                    | 3263             | 8.01  | 8.09  | 0.08                 | 8.66         |
| 1964 | 279                    | 3542             | 8.09  | 8.17  | 0.08                 | 8.45         |
| 1965 | 286                    | 3828             | 8.17  | 8.25  | 0.08                 | 8.92         |
| 1966 | 263                    | 4091             | 8.25  | 8.32  | 0.07                 | 10.43        |
| 1967 | 310                    | 4401             | 8.32  | 8.39  | 0.07                 | 9.49         |
| 1968 | 369                    | 4770             | 8.39  | 8.47  | 0.08                 | 8.61         |
| 1969 | 284                    | 5054             | 8.47  | 8.53  | 0.06                 | 11.98        |
| 1970 | 340                    | 5394             | 8.53  | 8.59  | 0.07                 | 10.64        |
| 1971 | 423                    | 5817             | 8.59  | 8.67  | 0.08                 | 9.18         |
| 1972 | 362                    | 6179             | 8.67  | 8.73  | 0.06                 | 11.48        |
| 1973 | 408                    | 6587             | 8.73  | 8.79  | 0.06                 | 10.84        |
| 1974 | 469                    | 7056             | 8.79  | 8.86  | 0.07                 | 10.07        |
| 1975 | 576                    | 7632             | 8.86  | 8.94  | 0.08                 | 8.83         |
| 1976 | 520                    | 8152             | 8.94  | 9.01  | 0.07                 | 10.51        |
| 1977 | 492                    | 8644             | 9.01  | 9.07  | 0.06                 | 11.82        |
| 1978 | 408                    | 9052             | 9.07  | 9.11  | 0.05                 | 15.02        |
| 1979 | 734                    | 9786             | 9.11  | 9.19  | 0.08                 | 8.89         |
| 1980 | 591                    | 10377            | 9.19  | 9.25  | 0.06                 | 11.82        |
| 1981 | 776                    | 11153            | 9.25  | 9.32  | 0.07                 | 9.61         |
2, certain journals that changed names over their history were either not indexed in Scopus or were not included in the same ASJC category. Furthermore, it is always possible that some literature may not have been captured by not searching other databases, however, this would have introduced considerable complexities with respect to the ability to analyse search results efficiently (i.e. deduplication of such a large volume of publications, bibliometric network visualizations). The use of the software tool VOSviewer to create and visualize bibliometric

| Year | Number of Publications | Cumulative Total | W1  | W2  | Relative Growth Rate | Doubling Time |
|------|------------------------|------------------|-----|-----|----------------------|---------------|
| 1982 | 785                    | 11938            | 9.32| 9.39| 0.07                 | 10.19         |
| 1983 | 746                    | 12684            | 9.39| 9.45| 0.06                 | 11.43         |
| 1984 | 727                    | 13411            | 9.45| 9.50| 0.06                 | 12.43         |
| 1985 | 774                    | 14185            | 9.50| 9.56| 0.06                 | 12.35         |
| 1986 | 870                    | 15055            | 9.56| 9.62| 0.06                 | 11.64         |
| 1987 | 923                    | 15978            | 9.62| 9.68| 0.06                 | 11.65         |
| 1988 | 846                    | 16824            | 9.68| 9.73| 0.05                 | 13.43         |
| 1989 | 1060                   | 17884            | 9.73| 9.79| 0.06                 | 11.34         |
| 1990 | 1628                   | 19512            | 9.79| 9.88| 0.09                 | 7.95          |
| 1991 | 1544                   | 21056            | 9.88| 9.96| 0.08                 | 9.10          |
| 1992 | 1545                   | 22601            | 9.96| 10.03| 0.07                | 9.79          |
| 1993 | 1720                   | 24321            | 10.03| 10.10| 0.07               | 9.45          |
| 1994 | 1475                   | 25796            | 10.10| 10.16| 0.06               | 11.77         |
| 1995 | 1865                   | 27661            | 10.16| 10.23| 0.07               | 9.93          |
| 1996 | 1800                   | 29461            | 10.23| 10.29| 0.06               | 10.99         |
| 1997 | 1877                   | 31338            | 10.29| 10.35| 0.06               | 11.22         |
| 1998 | 1982                   | 33320            | 10.35| 10.41| 0.06               | 11.30         |
| 1999 | 2089                   | 35409            | 10.41| 10.48| 0.06               | 11.40         |
| 2000 | 2330                   | 37739            | 10.48| 10.54| 0.06               | 10.87         |
| 2001 | 2499                   | 40238            | 10.54| 10.60| 0.06               | 10.81         |
| 2002 | 2751                   | 42989            | 10.60| 10.67| 0.07               | 10.48         |
| 2003 | 2802                   | 45791            | 10.67| 10.73| 0.06               | 10.97         |
| 2004 | 3061                   | 48852            | 10.73| 10.80| 0.06               | 10.71         |
| 2005 | 3908                   | 52760            | 10.80| 10.87| 0.08               | 9.00          |
| 2006 | 4637                   | 57397            | 10.87| 10.96| 0.08               | 8.23          |
| 2007 | 5310                   | 62707            | 10.96| 11.05| 0.09               | 7.83          |
| 2008 | 6216                   | 68923            | 11.05| 11.14| 0.09               | 7.33          |
| 2009 | 6582                   | 75505            | 11.14| 11.23| 0.09               | 7.60          |
| 2010 | 7088                   | 82593            | 11.23| 11.32| 0.09               | 7.72          |
| 2011 | 8691                   | 91284            | 11.32| 11.42| 0.10               | 6.93          |
| 2012 | 8194                   | 99478            | 11.42| 11.51| 0.09               | 8.06          |
| 2013 | 8920                   | 108398           | 11.51| 11.59| 0.09               | 8.07          |
| 2014 | 8642                   | 117040           | 11.59| 11.67| 0.08               | 9.03          |
| 2015 | 8825                   | 125865           | 11.67| 11.74| 0.07               | 9.53          |
| 2016 | 8930                   | 134795           | 11.74| 11.81| 0.07               | 10.11         |
| 2017 | 8471                   | 143266           | 11.81| 11.87| 0.06               | 11.37         |
| 2018 | 8212                   | 151478           | 11.87| 11.93| 0.06               | 12.43         |
| 2019 | 8471                   | 159949           | 11.93| 11.98| 0.05               | 12.73         |
| 2020 | 9591                   | 169540           | 11.98| 12.04| 0.06               | 11.90         |
Fig. 2 Co-Authorship Analysis of the 50 Most Productive Countries

Fig. 3 Co-Occurrence Analysis of the 500 Most Frequent Author Keywords
networks serves as an additional strength to the present study, providing a deeper layer of analysis with respect to the strength and nature of relationships between different items (countries, keywords, authors, journals). Two final limitations include the fact that independent search results were extracted and analysed by a single author, and therefore, were prone to increased error as opposed to had the analysis been conducted in duplicate; additionally, results were not screened as this would have been impractical, and possibly unfeasible without the application of an operational definition of TCAIM. Without doing this, however, it is possible that this analysis also included non-TCAIM literature published in journals categorized as “complementary and alternative medicine” by Scopus.

Conclusions
The present study provides current insight into the characteristics of publications published across TCAIM journals, and represents the largest bibliometric analysis conducted to date with respect to the TCAIM literature. The most productive countries included China, the United States, and Germany; unsurprisingly, a large proportion of common institutional affiliations and funding sponsors associated with this subset of publications also originated from these countries. The volume of publications has increased steadily since the 1940s, and a steep increase was observed between the mid-2000s and mid-2010s, which is largely attributable to increased available funding for TCAIM research globally. This upward trend has continued with 2020 marking the year with the most publications to date. Beyond identifying the large diversity of TCAIMs studied, this study also highlights therapies which may be understudied and warrant further investigation. Given a high prevalence of TCAIM use among patients, increased acceptance of TCAIM among conventional healthcare providers, and growing interest in the research of TCAIM, future work should continue to investigate and track changes in the publication characteristics of the emerging research on this topic. The creation of an operational definition of TCAIM informed by a systematic search strategy, followed by the development of standardized search strategies for major academic databases based on this operational definition, may serve to achieve these goals more comprehensively.

Abbreviations
ASJC: All Science Journal Classification; TCAIM: Complementary, alternative, and integrative medicine; NCCIH: National Center for Complementary and Integrative Health

Acknowledgements
JYN was awarded a Research Scholarship and an Entrance Scholarship from the Department of Health Research Methods, Evidence and Impact, Faculty of Health Sciences at McMaster University.

Author’s contributions
JYN: conceptualized and designed the study, collected the data, interpreted and analysed the data, drafted the manuscript, and gave final approval of the version to be submitted.

Funding
This study was not funded.

Availability of data and materials
All data generated or analysed during this study are included in this published article.

Declarations
Ethics approval and consent to participate
This study involved a bibliometric analysis of the literature only; it did not require ethics approval or consent to participate.

Consent for publication
The author consents to this manuscript’s publication.

Competing interests
The author declares that they have no competing interests.

Received: 19 April 2021 Accepted: 9 June 2021
Published online: 01 July 2021

References
1. Ventola CL. Current issues regarding complementary and alternative medicine (CAM) in the United States: part 1: the widespread use of CAM and the need for better-informed health care professionals to provide patient counseling. Pharm. Ther. 2010;35(8):461–8. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2935644/
2. National Center for Complementary and Integrative Health (NCCIH). Complementary, Alternative, or Integrative Health: What’s In a Name?, 2018. Available from: https://www.nccih.nih.gov/health/complementary-alternative-integrative-health-whats-in-a-name. Cited 2021 Apr 17.
3. Ng JY, Boon HS, Thompson AK, Whitehead CR. Making sense of “alternative”, “complementary”, “unconventional” and “integrative” medicine: exploring the terms and meanings through a textual analysis. BMC Complement Altern Med. 2016;16(1):134. https://doi.org/10.1186/s12906-016-1111-3.
4. World Health Organization. WHO global report on traditional and complementary medicine 2019: Institutional Repository for Information Sharing (IRIS), 2019. p. 226. https://apps.who.int/iris/handle/10665/312342. Cited 2021 Mar 28
5. Petri RP Jr, Delgado RE, McConnell K. Historical and cultural perspectives on integrative medicine. Med Acupunct. 2015;27(5):309–17. https://doi.org/10.1097/ACU.2015.1120.
6. World Health Organization. WHO traditional medicine strategy 2014–2023. Geneva: World Health Organization; 2013. p. 76. https://www.who.int/medicines/publications/traditional/trm_strategy14_23/en/.
7. Emsal N. Complementary and Alternative Medicine: Use and Public Attitudes 1997, 2006, and 2016. Vancouver: Fraser Institute; 2017. p. 87. https://www.fraserinstitute.org/sites/default/files/complementary-and-alternative-medicine-2017.pdf
8. Savas P, Robertson A, Beatty L, Hookings E, McGee M, Marker J, et al. Patient preferences on the integration of complementary therapy with conventional cancer care: Complementary therapy and cancer preferences. Asia Pac J Clin Oncol. 2016 Jun;12(2):e311–8. https://doi.org/10.1111/ajco.12226.
9. Verhoef MJ, Balneaves LG, Boon HS, Voegelinwey A. Reasons for and characteristics associated with complementary and alternative medicine use among adult cancer patients: a systematic review. Integr Cancer Ther. 2005; 4(4):274–86. https://doi.org/10.1177/1534735405282361.
10. Horneber M, Bueschel G, Dennert G, Less D, Ritter E, Zwahlen M. How many cancer patients use complementary and alternative medicine: a systematic review and metaanalysis. Integr Cancer Ther. 2012;11(3):187–203. https://doi.org/10.1177/1534735411423920.
55. Birch S, Lee MS, Alraek T, Kim TH. Overview of treatment guidelines and clinical practical guidelines that recommend the use of acupuncture: a bibliometric analysis. J Altern Complement Med. 2018;24(8):752–69. https://doi.org/10.1089/acm.2018.0092.

56. Lee IS, Lee H, Chen YH, Chae Y. Bibliometric analysis of research assessing the use of acupuncture for pain treatment over the past 20 years. J Pain Res. 2020;13:367–76. https://doi.org/10.2147/JPR.S235047.

57. Koo M. A bibliometric analysis of two decades of aromatherapy research. BMC Res Notes. 2017;10(1):1–9. https://doi.org/10.1186/s13104-016-2371-1.

58. Şenel E, Demir E. Bibliometric analysis of apitherapy in complementary medicine literature between 1980 and 2016. Complement Ther Clin Pract. 2018;31:47–52. https://doi.org/10.1016/j.ctcp.2018.02.003.

59. Moral-Munoz JA, Carbajo-Costa L, Herrera-Viedma E, Cobo MJ. Production trends, collaboration, and main topics of the integrative and complementary oncology research area: a bibliometric analysis. Integr Cancer Ther. 2019;18:1534735419846401. https://doi.org/10.1177/1534735419846401.

60. Yeung AW, Heinrich M, Atanasov AG. Ethnopharmacology—a bibliometric analysis of a field of research meandering between medicine and food science? Front Pharmacol. 2018;9:215. https://doi.org/10.3389/fphar.2018.00215.

61. Chiu WT, Ho YS. Bibliometric analysis of homeopathy research during the period of 1991 to 2003. Scientometrics. 2005;63(1):3–23. https://doi.org/10.1007/s11192-005-0201-7.

62. Salmerón-Manzano E, Garrido-Cardenas JA, Marzano-Agugliaro F. Worldwide research trends on medicinal plants. Int J Environ Res Public Health. 2020;17(10):3376. https://doi.org/10.3390/ijerph17103376.

63. Zhang YP, Hu RX, Han M, Lai BY, Liang SB, Chen BJ, et al. Evidence base of clinical studies on qi gong: a bibliometric analysis. Complement Ther Med. 2020;50:102392. https://doi.org/10.1016/j.ctim.2020.102392.

64. Cramer H, Lauche R, Dobos G. Characteristics of randomized controlled trials of yoga: a bibliometric analysis. BMC Complement Altern Med. 2014;14(1):1–20. https://doi.org/10.1186/1472-6882-14-328.

65. Jeter PE, Slutsky J, Singh N, Khalsa SB. Yoga as a therapeutic intervention: a bibliometric analysis of published research studies from 1967 to 2013. J Altern Complement Med. 2015;21(10):586–92. https://doi.org/10.1089/acm.2015.0057.

66. Vickers AJ. Bibliometric analysis of randomized trials in complementary medicine. Complement Ther Med. 1998(6):185–9. https://doi.org/10.1016/0965-2299(98)80026-5.

67. Wieland LS, Manheimer E, Sampson M, Barnabas JP, Bouter LM, Cho K, et al. Bibliometric and content analysis of the Cochrane Complementary medicine field specialized register of controlled trials. Syst Rev. 2013;2(1):1–3. https://doi.org/10.1186/2046-4053-2-51.

68. Wieland LS, Manheimer E, Berman BM. Development and classification of an operational definition of complementary and alternative medicine for the Cochrane collaboration. Altern Ther Health Med. 2011;17(2):50–9 https://www.ncbi.nlm.nih.gov/pubmed/PMC3196853/.

69. Veziari Y, Leach MJ, Kumar S. Barriers to the conduct and application of research in complementary and alternative medicine: a systematic review. BMC Complementary Altern Med. 2017;17(1):1–4. https://doi.org/10.1186/s12906-017-1660-0.

Publisher’s Note
Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Ready to submit your research? Choose BMC and benefit from:

- fast, convenient online submission
- thorough peer review by experienced researchers in your field
- rapid publication on acceptance
- support for research data, including large and complex data types
- gold Open Access which fosters wider collaboration and increased citations
- maximum visibility for your research: over 100M website views per year

At BMC, research is always in progress.

Learn more biomedcentral.com/submissions