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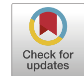
The Brief History of Complementary, Alternative, and Integrative Medicine Terminology and the Development and Creation of an Operational Definition



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A R T I C L E I N F O

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A B S T R A C T

The definition of complementary, alternative, and integrative medicine (CAIM) remains dynamic and complex despite a steady increase in the popularity/usage of CAIM therapies across the globe. A lack of consistency in how these terms are defined remains a challenge for researchers, clinicians, and national and international organizations (e.g., World Health Organization, National Center for Complementary and Integrative Health) alike. In the present article, we provide a brief history of the use of these terminologies, and then outline the process we took to develop and create an operational definition of complementary, alternative, and integrative medicine. Our operational definition is the first to be informed by a systematic search of four quality-assessed information resource types, ultimately yielding 604 unique CAIM therapies. We then developed a single search string for the most common bibliographic databases using the finalized operational definition list of CAIM therapies. These CAIM therapies were searched against the Therapeutic Research Center's "Natural Medicines" database for all 604 therapies, whereby each item's scientific name and/or synonym was included as a keyword or phrase in the search string. While the current definition is not without limitations and ongoing debates still surround the field, this work is arguably a steppingstone towards enabling increased collaboration and communication amongst healthcare clinicians, researchers, and the public. This operational definition provides a foundation for developing well-coordinated research efforts that will assist in the acceptance and understanding of this field, while also focusing on adopting knowledge translation techniques and efforts for further research advancement and use.

1. Introduction

Medical pluralism is defined as the existence of more than one medical system and describes different approaches that are available to individuals to promote health and treat illness.[1] More specifically, it can be regarded as the idea of the co-existence between "conventional medicine" and "unconventional medicine".[1, 2] Conventional medicine is defined by the National Cancer Institute (NCI) of the National Institutes of Health (NIH) as "a system in which health professionals who hold an M.D. or D.O. degree treat symptoms and diseases using drugs, radiation, or surgery." It can also be practiced by other health professionals such as nurses, pharmacists, physician assistants, and therapists.[3] Aiming to be evidence based, conventional medicine relies on the integration of research within clinical practice, however, not all conventional practices may be backed by evidence, and thus it should not be a focus for differentiating between conventional and unconventional medical systems.[4] Conventional medicine may also be referred to as Western medicine, biomedicine, scientific medicine, or modern medicine, however, in this article we will use "conventional medicine" to encompass these terms collectively.[5] Unconventional medicine is more complex in its definition, as there are many unconventional medical systems and practitioners. Thus, there is difficulty in creating a definition that encompasses a

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wide range of practices and beliefs arising from multiple histories, traditions, and philosophies.[6] For the purpose of this article, unconventional medicine will be defined as "medical interventions not taught widely at U.S. medical schools or generally available at U.S. hospitals", not to favor the American system, but rather to conveniently refer to a well-known conventional education and practice system.[7] These medical systems and practices have existed for many years and differences in characteristics such as epistemology, disease etiology, diagnostic methods, and healing methods have contributed to establishing a classification system that has dynamically changed throughout history.[2]

Cultural and geographical factors often influence a medical system's philosophy and practice.[8] However, the nature of what has been considered conventional medical practice has varied, and has dynamically changed based on time period as well as geographical region. For example, in the European Middle Ages, many diseases were cured by bloodletting, as they believed diseases were caused by an excess of blood. Hippocrates, an ancient Greek physician who was known as the "Father of Medicine", wrote about how the body could be cured by excess bleeding, cupping, and leeching.[9, 10] His writings influenced the majority of medieval Europe's medical practice and founded the basis of many university teachings at the time.[9, 10] These practices were considered the "obvious cure" to many ailments, and thus, they were passed down in Greek and Roman texts.[9] In contrast, monastic inhabitants such as monks and nuns looked at the spiritual influence on the body and practiced herbalism instead.[11] The evolution of ideas regarding what constitutes conventional or unconventional care has can be seen through significant shifts and advancements in scientific research and discovery. For example, in medieval Europe, the heavy influence from the Roman Catholic Church fueled religious practices and theories regarding the origin of disease.[9] Therefore, at this time, there was no tradition of scientific medicine, as many beliefs arose from either Greek and Roman texts which have been preserved in the monasteries, or spiritual influences that affected health.[9] This began to shift as we saw advances in the study of anatomy, the development of germ theory, and the development of formalized scientific methods.[12, 13] This increased knowledge led to an emphasis on evidence-based medicine and research to inform clinical practice. Thus, the way "conventional" versus "unconventional" medicine are defined has since changed due to advancements in medical treatments and what is considered "mainstream" practice. [9, 14] However, some of the oldest medical systems originate from Eastern traditions and have been re-imagined throughout the years by various countries based upon their own cultural practices and beliefs.[15-17] In addition to this, some countries have medical systems that are more pluralistic in nature – having both conventional medical practices and traditional practices co-exist. Among these is Ayurveda, a medical system originating in India more than 5000 years ago that is based on the idea that disease is due to an imbalance in the body and can be treated with special herbal remedies and by practices such as yoga and meditation.[18, 19] Similarly, traditional Chinese medicine (TCM) has been found in writings dating back to the third century B.C.E. having been practiced for about 3000 years.[20, 21] TCM relies on practices such as acupuncture, moxibustion, and herbal medications to maintain balance within the body, a philosophy which TCM practitioners believe is the balance between the Yin and Yang.[20, 21] For both of these medical systems, whether they are currently considered conventional or unconventional varies based on culture and geographical region. In India, practitioners undergo state-recognized, institutionalized training, as there are over 240 colleges that offer a graduate-level degree in Ayurvedic Medicine and Surgery.[22] However, in the United States, there is no training for Ayurvedic practitioners and there is no national regulation.[23] Likewise, TCM practices are taught to physicians in China, as their qualifications not only include clinical (Western medicine), but also dental medicine, public health, and TCM.[24] In Canada and the United States however, TCM is not taught in the medical school curricula. TCM is professionally regulated in certain Canadian provinces, and has associated regulatory colleges.[5, 25] Likewise, in the United States, TCM is regulated in specific states and has associated professional organizations as well, in addition to certification agencies.[26] Thus, it is clear that although practices such as Ayurveda and TCM are commonly practiced in their respective countries, they are regarded entirely as complementary and alternative medicine (CAM) in the Western world.[5] Adjectives such as "complementary", "alternative", and "integrative", followed by the word "medicine" or "health". are considered to be Westernized terms as in many non-Western cultures such as those listed above, traditional medical practices are not distinguished from conventional medicine in the same way.

The practice of homeopathy is one of the earliest examples of an alternative approach to scientific medicine in Europe. In the mid-nineteenth century, homeopathy began to gain popularity in the Western world.[27, 28] Founded by German physician Samuel Hahnemann after being inspired by the effects of the cinchona tree, the concept of homeopathy began with curing illness with medicines producing the same symptoms to a lesser degree.[27] This school of thought also emphasized holistic medicine, or focusing on patients as a whole by acknowledging aspects of health outside the physical body.[27] Holistic medicine goes beyond a solely biological approach to incorporate psychological, familial, societal, ethical and spiritual components of healthcare.[29] Following its founding in Germany, Hans Burch Gram came to the United States in 1825 as its first homeopathic physician.[28] As homeopathy evolved over time, its influence led to the founding of the American Institute of Homeopathy in 1844 and finally the acceptance of homeopaths into the American Medical Association (AMA) in 1903.[27, 30]

The rising influence and public perspective of unconventional medicine in the United States and Canada was dramatically impacted by Abraham Flexner in 1910, when the Carnegie Foundation for the Advancement of Teaching published Flexner's report outlining medical education in the two countries.[31, 32] Using criteria such as the extent of privilege medical schools shared with associated hospitals, admission standards, physical facilities, professors' instruction, and laboratory equipment, Flexner evaluated 155 schools within two years.[31] Flexner's views regarding unconventional approaches as "nonscientific" competition to research and education were reflective in his work.[33] Having described unconventional medicine as "charlatanism", he aimed to expunge their role in medicine and openly admitted to doing so.[33] In addition to unconventional medical approaches, Flexner's report also disproportionately targeted majority-black schools.[34] Written at a time of changing social context and economic growth, particularly in regard to biomedical funding, Flexner's report had a substantial impact on medical education in North America.[33] Following its publication, many schools were shut down and the 131 medical schools in the United States decreased to 76.[31, 35] These included the majority of American unconventional medical institutions, such as those teaching naturopathy, homeopathy, osteopathic medicine, chiropractic medicine, and eclectic therapy, thus substantially decreasing the development of unconventional medicine and education at the time.[33]

The order of events leading from acceptance of homeopaths in the AMA to the rejection of homeopathy curriculum by Flexner sharpened the distinction between conventional and unconventional medicine. Despite the impact of Flexner's report on the inclusion of unconventional medicine within medical education, unconventional medicine continued to be practiced. The 1960's brought increasing support for unconventional medicine and its holistic, humanistic approaches.[33] Since then, unconventional medicine has garnered more support in the forms of various officially recognized organizations.[33] In 1991, the Office of Alternative Medicine (OAM) was founded, before being reestablished into an independent center as the National Center for Complementary and Alternative Medicine (NCCAM) in 1998.[36, 37] In 2014, NCCAM was renamed the National Center for Complementary and Integrative Health (NCCIH).[37] Today, unconventional medicine continues to rise in popularity.[38, 39] Given its importance and prevalence, this paper discusses the creation of an operational definition of unconventional medicine, such as complementary, alternative and integrative medicine (CAIM),

to aid in facilitating more effective and efficient research and communication.

2. Terminology

Various adjectives exist to describe the type of medicine (or sometimes referred to as health) commonly practiced by practitioners of health care (i.e., physicians) such as “Western”, “mainstream, “conventional, “allopathic, “bio-”, and “orthodox ” among others.[3, 40, 41] Considering that this article focuses on defining various terminologies, we felt it was crucial that a relatively neutral term with little negative or positive connotation be used for the purpose of this article. Henceforth, the term “conventional medicine” will be used to describe the category of medicines outside of CAIM.

There are challenges in defining terminology that refers to medical treatments outside the scope of conventional medicine.[6] Over the past many decades, organizations such as the World Health Organization (WHO) and the NCCIH as well as researchers belonging to systems outside of conventional medicine have been unable to agree upon a universal name. Various terms have been proposed to describe therapies that are not part of conventional medicine, including “alternative”, “complementary” and “unconventional” medicine.[42] The term “integrative medicine” is another common term prevalent in this field; however, it refers to integration and thus encompasses both conventional and unconventional medicine. Although “traditional medicine” is another common term prevalent in literature, we view it as distinct from CAIM in that it describes a system of medicine based on origination from a region/culture, as opposed to describing a system of medicine in competition with conventional medicine. However, even within traditional medicine, there will be some cases where it may be in competition with conventional medicine, however, on a case-to-case basis, hence requiring the need for analysis of traditional medicine based on specific culture or geographical regions as opposed to general traditional medicine. Due to the vast nature and complexities of traditional medicine, we decided to exclude this concept, as this could constitute an entirely separate (series of) article(s). A textual analysis of CAIM-related terms involving literature published between 1975 and 2013 found the first instances of these terms being used as follows: “alternative medicine” (1975),[43] “unconventional medicine” (1980),[44] complementary medicine” (1984),[45] “complementary and alternative medicine” (1994),[46] and “integrated/integrative medicine” (1995).[42, 47]

“Alternative medicine” was one of the earliest terms used to describe a broad range of modalities that do not fall under the category of conventional medicine, typically supported by traditions and concepts rarely used in Western medicine.[41] According to the US National Center for Complementary and Integrative Health (NCCIH), “alternative health” is defined as when “a non-mainstream approach is used in place of conventional medicine.”[48] The NCCIH defines “complementary health” as “a non-mainstream approach used together with conventional medicine.”[48] However, the World Health Organization (WHO) does not differentiate between “complementary” and “alternative”, mentioning them together as a “broad set of health care practices that are not part of that country’s own tradition or conventional medicine and are not fully integrated into the dominant health-care system.”[49] Although the WHO mentions integrative medicine alongside CAM, they do not provide an explicit definition. The NCCIH, however, states that integrative health “brings conventional and complementary approaches in a coordinated way. Integrative health emphasizes multimodal interventions, which are two or more interventions such as conventional health care approaches (like medication, physical rehabilitation, psychotherapy), and complementary health approaches (like acupuncture, yoga, and probiotics) in various combinations, with an emphasis on treating the whole person rather than, for example, one organ system. Integrative health aims for well-coordinated care among different providers and institutions by bringing conventional and complementary approaches together to care for the whole person.”[48]

Alternative medicine is often categorized with complementary medicine under the broader term “complementary and alternative medicine”. Ng et al.[42] found that the adjectives “unconventional”, “alternative”, “complementary”, and “complementary and alternative” are defined similarly and used interchangeably in the literature, whereas the meanings associated with “integrated/integrative” are unique.[42] The contrast relates to how integrative/integrated medicine is characterized by “what is”, including a new healthcare system that combines unconventional and conventional medicine. Authors that utilized the term “integrative/integrated” described it in a way that allowed it to exist independently, rather than by defining it by something that is “not”.[42] This includes therapies that emphasize bio-psycho-socio-spiritual dimensions of a person, therapies that consider factors including mind, spirit, community and body, as well as therapies that focus on preventative maintenance of health by considering lifestyle components such as diet, exercise, stress management and emotional well-being.[42] The former four terms as compared to “integrated/integrative”, however, are defined by “what is not”, where they are categorized as therapies/interventions *not* part of or used in the world of conventional medicine.[42] Authors that utilized these terms in their research defined them as something that *was not* within the field of conventional medicine, such as acupuncture, herbal medicine, hypnosis, homeopathic treatments, etc.[42]

It is important to recognize that these are dynamic definitions that have fluctuated throughout the years. For example, the term “alternative medicine” dominated literature until 1990 and thereafter the use of the term “complementary medicine” began to rise and has remained constant until 2013.[42] The term “complementary and alternative medicine” formed as a combination to encompass both “complementary medicine” and “alternative medicine” terms, increasing since the 2000s and becoming the most commonly used term in literature.[42] “Integrated medicine” or “integrative medicine” emerged most recently in 1995 and its use has slowly increased each year. Interestingly, the use of the term “complementary and alternative medicine” increased sharply around the same time that both the terms “complementary medicine” and “alternative medicine” began to decline.[42] This observation suggests a shift from these two terms to the more general term “complementary and alternative medicine” in research, which continues to show an increasing trend. The variety of terms used to describe both conventional and complementary, alternative and integrative medicine (CAIM) are continuously evolving. While acknowledging the differences between these different terms, for the sake of simplicity, we will be referring to the entirety of these therapies as “CAIM” for the remainder of this article.

The pervasiveness of CAIM term usage and its implications make it an essential concept to address. Some organizations have provided theoretical definitions in an attempt to provide a universal standard for their use. Despite distinct variances in their theoretical definitions, the aforementioned terms are frequently used interchangeably without regard for potential differences or a universal agreement of which are “correct”.[48]

3. Defining Categories of CAIM

Multiple classification systems attempt to group the many existing CAIM approaches. The NCCIH currently divides CAIM into three primary categories: psychological, nutritional, and physical. Psychological approaches focus on the mind, such as mindfulness and spiritual practices.[48] Nutritional approaches are centered around products such as probiotics, vitamins and minerals, herbs, and dietary supplements. Approaches in this category are often highly advertised and easily accessible. In 2012, the National Health Interview Survey found that natural health products, defined as dietary supplements other than vitamins and minerals, were used by 17.7 percent of American adults.[50] Research has suggested potential benefits of certain nutritional supplements in various conditions including polycystic ovary syndrome, pediatric cancer,

and attention deficit hyperactivity disorder.[51-53] Finally, heat and cold therapies, massages, and spinal manipulation are examples of physical approaches. Psychological, nutritional, and physical therapies are often used side by side, and many CAIM therapies are combinations of both or all these classes. For instance, yoga, tai chi, dance, and acupuncture are therapies that would fall under both psychological and physical therapy. Similarly, mindful eating would be a combined psychological and nutritional approach. It is also worthwhile to note that certain practices may be exceptions to these classifications, such as homeopathy.[48]

Although earlier CAIM classification system by the NCCIH/NCCAM has evolved into a more comprehensive and detailed system, it is still used by other organizations such as the NCI. This earlier system classified CAIM into five main categories: mind-body therapies, that seek to relax the body and mind; biologically based practices, which utilize things found in nature; manipulative and body-based practices, which work with physical manipulation of the body for relief; energy healing, which strives to balance energy flow in the patient; and whole medical systems, which are healing systems with a defined philosophy, theory, and practice and differ based on culture and geographical locations.[3, 54] Regardless of classification, advocates for CAIM emphasize its ability to relieve symptoms, improve quality of life, and protect against illness and disease in patients. Research indicates that CAIM users tend to largely be between 30 to 49 years old and have more education as well as a higher income.[55] Users of CAIM have also commonly cited a desire to control side-effects and having been dissatisfied with physicians' attitudes or the results of conventional medicine, alongside wanting their healthcare to include a spiritual component that focuses on the meaning and purpose of life, as reasons for using these therapies.[56, 57] A study surveyed over 1000 breast cancer survivors, and reported that most participants used complementary and alternative medicine, the most prevalent barriers to CAIM use were found to be high costs and a lack of information about CAIM. Other less common barriers included a fear of therapy outcomes and a lack of time and accessibility.[58]

In all, CAIM encompasses a large number of nutritional, psychological, physical and combinatory therapies that are growing in popularity.[48] In countries with a predominant population of low- and middle-class incomes, approximately 80% depend on CAIM to meet primary healthcare needs.[59] The acceptance and usage of CAIM varies across medical specialties but is most accepted in the realm of family medicine and most commonly used in obstetrics and gynecology.[60] Overall, there was a 52% acceptance in the use of CAIM across the medical specialties and a 45% prevalence of usage across medical specialties.[60] In a study published in 2017, it was found that 79% of Canadians have used at least one CAIM therapy in 2016. This shows a slight increase in the popularity of CAIM when compared to 2006, where 74% of individuals utilized at least one CAIM therapy.[61] Overall, there is a trend of increasing CAIM use over time across all ages.[62]

4. Ongoing Challenges within the Field of CAIM

An increasing trend in the volume of CAIM publications has become especially apparent over the last few decades. This upwards trend has steadily continued, with 2020 marking the most productive year with a record number of CAIM publications.[63] While recent research has allowed for a greater contribution towards an explicit definition of CAIM, there is still a paucity of information within this research field compared to conventional medicine. Despite the growing popularity and usage of CAIM across the globe, challenges in conducting and applying current evidence-based research remain a concern for researchers and clinicians interested in promoting and advancing this field.

One of the most common barriers commonly associated with conducting CAIM research is access, where researchers and organizations lack funding, training, and skills.[64] The skills, knowledge and competency of researchers is another factor that can act as a hindrance.[64] Issues that result in lower competency can include inadequate training, insufficient experience or limited literacy in research. Another factor that can act as an obstacle is bias, which can lead to negative connotations associated with CAIM research compared to mainstream scientific research.[64] A common assumption that CAIM is not supported by evidence underlies this perspective and is a common bias that needs to be addressed.[65, 66] Other examples of bias include, but are not limited to, the lack of recognition of CAM and its respective research by the mainstream medical community, and the insufficient collaboration between CAM and mainstream medical scientists.[64, 66]

As previously mentioned, varied practices across different countries and cultures, as well as the languages of CAIM research publications, present unique challenges to an already confusing debate as to what truly constitutes a CAIM therapy. Theoretical definitions, such as those provided by the NCCIH and the WHO to define CAIM terms, explain the fundamental meaning behind the concept and characterize the nature of the construct. This alone may not be a sufficient method for classifying whether individual terms (therapies or treatments) are included in a construct, such as CAIM. With increasing research and discoveries of treatments that can be considered CAIM, theoretical definitions can become flawed in providing the parameters of what CAIM constitutes. Despite the dramatic increase in CAIM research interests and literature, the lack of standardization across the research community attested to the need for creating a comprehensive definition.

5. Operational Versus Theoretical Definitions of CAIM

Developing an operational definition supports the harmonization of CAIM-related research and provides a universal definition through the provision of a standard of classifying CAIM terms. Theoretical definitions will not inform whether, for example, Tai Chi or mind-body therapy or vitamin A supplementation, are CAIM therapies. One may reflect on whether a therapy meets the theoretical definition, but this process is insufficient in providing concrete tests to indicate a 'yes' or 'no' of the inclusion of a therapy. Due to this reason, operational definitions, although complex for various reasons, are more useful because they identify the parameter of a construct based on the inclusion/exclusion of certain terms or topics.[67]

Operational definitions of CAIM are dynamic, changing over time and varying geographically. For example, due to cultural differences, the type of therapies, treatments or approaches people use in the United States will be distinct from those used by people in Malaysia, as one example.[68, 69] Updates to an operational definition of CAIM over time can result in the addition or omission of therapies. This can be due to their increase in popularity which consequently moves them into conventional practice because it is supported by evidence such that conventional practitioners and educators support their inclusion in conventional medicine, or that they eventually become so unpracticed or are deemed universally ineffective/unsafe that they are excluded.[66, 70] The dynamic nature of an operational definition thus requires consistent updating and re-analysis by researchers to ensure it encompasses the latest research data found in the literature.

One of the most important aspects of forming an operational definition was to reflect on the theoretical definitions and form lists/groups that constituted the term based on that definition. Our recent study which reports an updated operational definition of CAIM used a systematic search method as a novel process of identifying the parameters.[71] With the exponential growth of literature in this field, utilization of bibliographic databases to extract large quantities of data was useful in identifying a wide array of terms that may have been excluded in the past.

Standardizing a series of definitions also stands to benefit academia regarding all aspects of medicine, making for more effective collaboration in research while reducing duplication and promoting harmonization in literature.[67] Moreover, clearer definitions would help reduce preconceived notions and biases that are commonly prevalent in literature. The dynamic nature of this operational definition due to ever growing

research means a need will exist to frequently update it based on new literature.

6. Creating an Operational Definition of CAIM

The development of a comprehensive and novel operation definition of CAIM was recently published by Ng et al.[71] Specifically, we conducted systematic searches from various quality-assessed media sources including peer-reviewed articles from scientific databases, "Aims and Scope" webpages of peer-reviewed CAIM journals, entries containing CAIM therapies/treatments in highly-accessed online encyclopedias, and highly ranked websites found through Health On the Net Code of Conduct (HONCode) searches.

First, Ng et al.[71] conducted a systematic review of CAIM terminology literature across bibliographic databases including MEDLINE, EMBASE, AMED, PsycINFO, CINAHL, SCOPUS, and Web of Science.[71] These databases were chosen because they are known to contain the vast majority of research articles relevant to medicine, including CAM. Each database was searched from inception using a search strategy constituting terms that commonly refer to CAIM.[48] Titles and abstracts of these articles were then screened to identify eligible full-text articles. After extraction and thorough review in duplicates, only peer-reviewed articles that explicitly listed multiple CAIM therapies or provided CAIM-related terms/groups (i.e., a list of complementary medicines, etc.) were deemed eligible. Citations listed in these articles were also screened for retrieval of additional relevant literature to broaden the range of CAIM terms that can contribute to the operational definition. All CAIM terms from these articles were retrieved, recorded and deduplicated.

"Aims and Scope" webpages of peer-reviewed journals were only considered if they contained the words "complementary", "alternative" and/or "integrative". Eligibility of these webpages was determined using the "Complementary and Alternative Medicine" category in Scimago and "Integrative and Complementary Medicine" category in Journal Citation Reports.[72, 73] Online encyclopedias were identified using the Alexa ranking system and were considered eligible only if they were prohibited from being publicly editable and contained entries relevant to CAIM.[74] Unfortunately, as of September 2020, this list of encyclopedias provided by Alexa is no longer accessible.[74] Finally, websites were identified by search strategies pertinent to CAIM definitions via HONcode searches.[75] These websites were only considered eligible if they contained CAIM therapies. Terms that commonly refer to CAIM, as described in Ng et al.,[71] were searched on HONcode and the first 20 results were reviewed for each search.[71] Eligible items identified from all these media sources were also screened.

All CAIM treatments/therapies from eligible peer-reviewed articles, HONcode searchers, online encyclopedias, journals' "Aims and Scopes" webpages, as well as those from the website of the previously existing Cochrane operational definition of complementary medicine, were extracted. CAIM terms yielded from all data extractions were then compiled into a comprehensive list followed by deduplication.

This list was then reviewed for accuracy, as well as in deciding whether a therapy was considered a CAIM therapy. Judgment by an evaluator experienced in this field was exercised when conducting these two tasks. After finalizing the list of CAIM terms, identical therapies/treatments were grouped together. For further guidance, monographs published by the Natural Medicines Research Collaboration were used to identify common and scientific names pertinent to each CAIM treatment/therapy, thus making the list more comprehensive.[76] This operational definition, constituting the final comprehensive list of CAIM terms, was used to develop a search string strategy consisting of 604 unique CAIM therapies.[71, 77] The complete operational definition can be found here: https://bmccomplementmedtherapies.biomedcentral.com/articles/10.1186/s12906-022-03556-7/tables/2. Multiple search strings were created and specialized for each database for researchers to be able to run.[71] For example, the OVID database, which encompasses MEDLINE, EMBASE, AMED and PsychINFO, uses different proximity searching and wildcards than SCOPUS, and thus, required a differently designed search string.[78] At present, this operational definition of CAIM has been by Cochrane Complementary Medicine as the most up-to-date list of these therapies.[79]

7. Limitations in Developing an Operational Definition of CAIM

While the operational definition will serve to benefit the future of CAIM research, it is important to recognize that it is not without its limitations. Some therapies may have been under- or over-included given that our search string was derived from an operational definition that was constructed based on available English literature that was available to the authors themselves.[77] Moreover, certain types of CAIMs are challenging to define and categorize as they originate from different cultures, systems of medicine, and schools of thought.[71]

Additionally, it must be acknowledged that this operational definition of CAIM itself has been developed in the context of Western medicine. Although our operational definition is a step in the right direction towards standardization within this context, it will not necessarily be an agreed upon standard within the context of other world regions. Further work in developing and updating culturally-specific operational definitions of CAIM may aid in tackling this conundrum and ensure that researchers are able to effectively apply concepts/constructs relevant to their research, thus allowing for synonymous communication between researchers, patients, and the public.[71]

8. Future Directions

Due to the ongoing growth of CAIM literature, it would be of great value for the present operational definition to be routinely updated based on the emergence of new CAIM publications and literature. Categorizing CAIM therapies where a general consensus can be confirmed will also aid in the refinement of the current operational definition. Other CAIM researchers would also benefit from assessing whether the search string (defined by the operations definition) appropriately captures the CAIM literature compared to other available alternatives, as well as an assessment by librarians and other information specialists to iteratively improve the current search string. By taking these steps, CAIM, as an overall field, can build a strong foundation in developing well-coordinated research efforts that will assist in the acceptance and understanding of CAIM research, while also focusing on adopting knowledge translation techniques and efforts for further research advancement and use.

9. Conclusion

The definition of CAIM remains dynamic and complex with a steady increase in the popularity and usage of CAIM therapies across the globe. The creation of an operational definition of CAIM is valuable in defining and identifying parameters that can aid in the standardization and classification of CAIM therapies. While the current definition is not without limitations and ongoing debates still surround the field of CAIM, this operational definition is a stepping stone towards enabling increased collaboration and communication amongst healthcare clinicians, researchers, and the public.

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Conflict of interests

JYN and LSW are both editorial board members of the journal but their editorial role had no bearing on the review process or decision. The authors declare no other competing interests.

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Ethical statement

This is an educational article; it did not require ethics approval or consent to participate.

Data availability

All relevant data are included in this manuscript.

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