

Growing Use of Complementary and Alternative Medicine (CAM) in Mainstream Healthcare: A Review of Case Reports

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ABSTRACT

Introduction: The integration of Complementary and Alternative Medicine (CAM) into mainstream healthcare systems has been growing, reflecting a shift towards more holistic and patient-centered care. This study explores the integration of CAM into mainstream healthcare by analyzing case reports. The aim was to elucidate the trends in CAM utilization, identify associated challenges, and explore potential opportunities for enhancing patient outcomes and healthcare delivery.

Methods: A comprehensive literature search was performed across multiple electronic databases, including PubMed, Scopus, Web of Science, and Google Scholar. The search covered case reports published between January 2004 and April 2024, using both Medical Subject Headings (MeSH) terms and free-text searches. The quality of the case reports was assessed using criteria adapted from the CARE guidelines, which emphasized the clarity of reporting, the appropriateness of study design, documentation of clinical outcomes, and potential biases.

Results: The review identified a wide variety of CAM modalities used within mainstream healthcare, such as acupuncture, herbal medicine, chiropractic care, and mind-body practices. These modalities demonstrated efficacy in managing a range of health conditions and often complemented conventional treatments, enhancing patient outcomes. However, the review also highlighted several challenges, including adverse events linked to certain CAM interventions and disparities in access to CAM services among different patient populations.

Conclusion: CAM integration enhances patient-centered care but presents challenges like adverse events and unequal access. Research, education, interdisciplinary collaboration, and evidence-based practice are vital for safe, ethical integration, improving patient care.

Keywords: Complementary therapies; Alternative medicine; Evidence-Based Practice; Patient-Centered Care; Alternative medicine use; Integrative medicine

Introduction

Complementary and Alternative Medicine (CAM) comprises a diverse range of healthcare practices and therapies that fall outside the scope of conventional Western medicine. These practices and therapies encompass various approaches to health and wellness, emphasizing holistic care, natural remedies, and individualized treatment plans. CAM modalities often focus on preventive care, promoting overall well-being, and addressing the root causes of health issues rather than merely treating symptoms [1]. Over the past few decades, CAM modalities have seen a significant rise in both popularity and integration into mainstream healthcare systems worldwide. This trend has led to a more widespread acceptance and utilization of holistic

and personalized treatment options. Healthcare providers are increasingly incorporating CAM practices alongside conventional treatments to offer more comprehensive care [2].

Patients increasingly seek CAM therapies for various health conditions, often in conjunction with conventional medical treatments [3]. According to the World Health Organization, about half the population in many developed countries now regularly use some form of traditional and complementary medicine (T&CM). In the United States, 42.0% of the population utilizes T&CM therapies. Australia sees a similar trend with 48.0% of its population engaging in these practices. In France, 49.0% of individuals incorporate T&CM into their health routines, while in Canada, the level of T&CM use is notably higher, with 70.0% of the

population regularly employing these methods [4]. The data shown in Figure 1 below reflects the evolving healthcare paradigms that emphasize patient-centered care, holistic wellness, and personalized treatment approaches with far-reaching impact on public health and wellbeing.

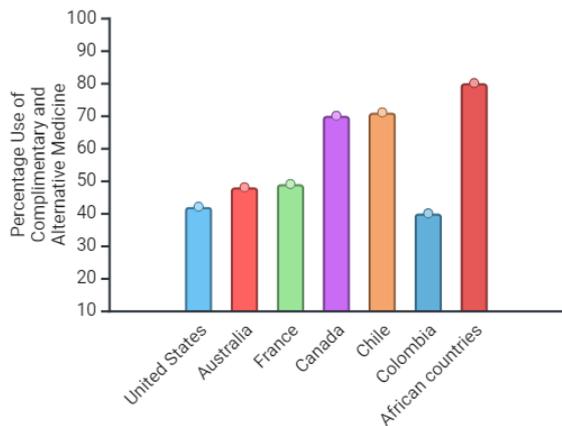


Figure 1 The use of CAM in some industrialized and developing countries

Harnessing evidence from case reports in CAM provides critically important insights into individual patient experiences and treatment outcomes. These reports are invaluable for identifying potential benefits, adverse effects, and interactions of alternative therapies that may not be evident in larger clinical trials. They help clinicians make informed decisions, guide future research, and support the integration of these therapies into mainstream healthcare [5]. This study explores the burgeoning integration of CAM within mainstream healthcare systems through an in-depth review of case reports. By scrutinizing individual cases, we aim to shed light on the diverse ways in which CAM modalities are being employed, their efficacy in complementing conventional treatments, and the unique challenges and opportunities they present within the healthcare landscape.

Methods

A comprehensive literature search was conducted using the PubMed, Scopus, Web of Science and Google Scholar electronic databases. Medical Subject Headings (MeSH) terms related to CAM, mainstream healthcare, and case reports were utilized to identify relevant articles from PubMed, while a free-text search of the topic was used for Scopus, Web of Science, and Google Scholar databases. To enhance the study's yield, the Boolean search strategy was employed, combining both keywords and MeSH terms for the main variables. The search terms used included: ['Case Histories' OR 'Case Reports' OR 'Case Studies' OR 'Case Study'] for case reports; ['Alternative Medicine' OR 'Alternative Therapies' OR 'Complementary Medicine'] for complementary and alternative

medicine. Synonyms like 'conventional healthcare', 'traditional healthcare' and 'western medicine' were also used in place of mainstream healthcare in the free text search, while 'increasing use' and 'enhanced utilization' were also used in place of 'growing use'. The search terms were entered into the database using 'AND' between each term. The search covered articles published from January 2004 to April 2024. Studies on relevant topics with abstracts written in English were identified through these search methods, collated from different databases, and uploaded to the Rayyan website.

Following the upload of identified relevant topics and their abstracts to the Rayyan website, duplicates were easily identified based on a minimum of 96.0% similarity score. After cross-checking and confirmation, duplicate articles were deleted. Subsequently, all full-length and English-language papers were retained for analysis. Titles and abstracts of retrieved articles underwent screening to identify potentially relevant studies, resulting in a total of 20 articles gathered.

Included studies comprised case reports or case series describing the use of CAM in mainstream healthcare settings. Excluded studies were non-case report studies, studies focusing solely on CAM without integration into mainstream healthcare, and studies lacking sufficient detail on the CAM interventions employed.

The methodological quality of included case reports was assessed using established criteria adapted from the CAse Report (CARE) guidelines. This assessment considered aspects such as clarity of reporting, appropriateness of each study, documentation of clinical outcomes, and potential biases.

This review adhered to ethical standards regarding the use of published data, ensuring confidentiality and anonymity of patients included in case reports. No primary data collection involving human subjects was conducted as part of this study.

Therapies, Practices, and Interventions

Acupuncture

Acupuncture, a traditional Chinese medicine practice involving the insertion of thin needles into specific points on the body, has garnered attention for its potential efficacy in pain management, stress reduction, and various medical conditions [6]. Numerous clinical trials and meta-analyses have demonstrated acupuncture's effectiveness in alleviating chronic pain, nausea/vomiting, and musculoskeletal disorders [7].

A case report documented the report of two post-COVID-19 patients with olfactory dysfunction who found relief through acupuncture treatment targeting the Yingxiang point (LI20). Administered 1–2

times weekly about 6–7 months post-diagnosis, acupuncture needles were inserted 10 mm deep into the skin and left in place for 15 minutes. Symptoms improved immediately post-treatment, lasting 2–4 days, with longer intervals between flare-ups as treatment continued [8].

Similarly, a 73-year-old male chef with a history of hyperlipidemia and intracerebral hemorrhage developed COVID-19 pneumonia, necessitating mechanical ventilation and tracheostomy due to respiratory distress. After testing negative for COVID-19 and being weaned off ventilation, he experienced cardiac arrest with pulseless electrical activity (PEA). Resuscitation efforts were successful, but he remained comatose with signs of hypoxic-ischemic encephalopathy (HIE). Acupuncture treatment, based on Huangdi Neijing principles, was initiated thrice weekly. After the first session, the patient showed intermittent consciousness and limb movements, progressively

improving to being ventilator-free within two weeks and achieving a Glasgow Coma Scale score of 6. Follow-up imaging demonstrated lung improvement [9].

The case of a 63-year-old man undergoing immune checkpoint inhibitor (ICI) therapy and chemotherapy for lung malignancy who developed Guillain-Barré Syndrome (GBS), characterized by limb weakness, numbness, and pain, was also reported. Despite receiving high doses of intravenous gamma globulin, significant numbness and pain persisted. After four acupuncture treatments, the patient experienced notable alleviation of limb numbness and fatigue without discomfort [10].

Also, a case series reported 7 case reports in which acupuncture was effective in alleviating symptoms and shortening hospitalization duration for COVID-19 patients, particularly benefiting the elderly [11].

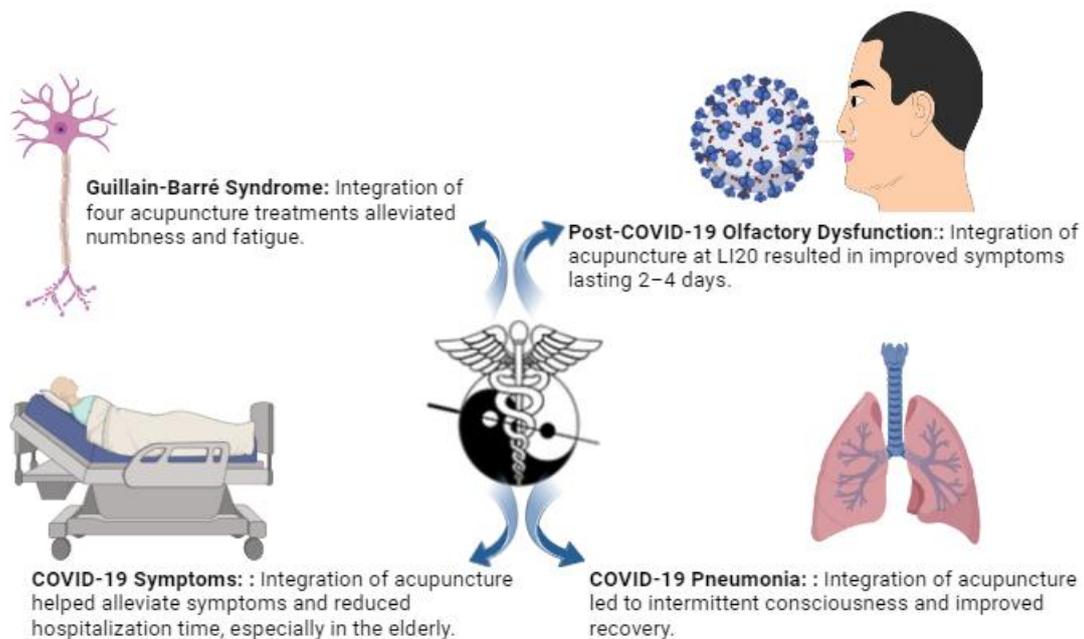


Figure 2 Integrating acupuncture into mainstream healthcare practices

However, despite the scarcity of case reports documenting the ineffectiveness or failure of acupuncture to improve symptoms, a review of 37 studies, which included 27 single case studies and 10 case series, reported several adverse events with some acupuncture techniques and deaths alongside the successes recorded as shown in Figure 2, which is less often reported [12].

Herbal medicine

Herbal medicine, another prominent CAM modality, utilizes plant-derived substances for therapeutic purposes. While herbal remedies have been used for centuries in diverse cultures, their efficacy and

safety have remained a subject of ongoing research and debate [13-15]. There are concerns that there has been a growing use of herbal remedies in mainstream healthcare. A typical case report is seen in the documented case of a widowed 47-year-old heterosexual woman, who presented with complaints of genital warts persisting for the past two months. Upon dermatovenerological examination, papules were observed on the major and minor labia, appearing verrucous, multiple, and with skin and mucosa coloring. No tenderness or bleeding was noted. A speculum examination revealed no lesions on the vaginal wall. The acetowhite test yielded a positive white coloration. A diagnosis of condylomata acuminata was made. The

patient underwent electrocautery therapy once and was prescribed Echinacea 500 mg for three months. Follow-up examinations over six months showed no new or recurrent lesion [16].

Another case involved a 50-year-old woman, a known type 2 diabetes, hypertension, and obese patient, who was referred to the Department of Medicine and Gastroenterology at Saudi German Hospital, Jeddah, in January 2022 due to elevated liver enzymes discovered incidentally. Physical examination revealed a palpable liver and mild splenomegaly. Liver function tests showed elevated levels of ALT, AST, and GGT, indicating a high risk of liver fibrosis. Diagnosis of non-alcoholic steatohepatitis (NASH) was confirmed, prompting treatment initiation. The patient was prescribed weight reduction measures, simvastatin for dyslipidemia, and silymarin, the active ingredient in milk thistle, for hepatoprotection. Over four months, silymarin therapy led to a gradual decrease in liver enzyme levels and lipid profile improvement without adverse effects, demonstrating its potential as an adjunct therapy for NASH management [17].

A case report documented the effectiveness of topical Chamomile Oil in the management of Infantile Colic Symptoms. The management of a two-month-old male infant experiencing severe colicky abdominal pains for five weeks, who was referred to the pediatric clinic. Despite previous therapeutic interventions, including traditional methods, his cries intensified, reaching 5 hours a day. Seeking relief, his parents turned to topical chamomile oil, applying it to his abdomen three times daily. By the end of the first day, crying duration decreased by approximately 30 minutes. Remarkably, by the seventh day of treatment, crying duration significantly reduced to three hours within 24 hours. In addition, the infant's sleep time increased by the end of the seventh day [18].

However, despite reported successes, there are many case reports reporting several cases of adverse effects associated with herbal medicines in mainstream healthcare. One case described a 51-year-old male with psychoactive substance use disorder, on long-term methadone therapy, who presented with confusion and agitation after consuming high doses of milk thistle seeds to "detoxify" his liver. Symptoms included hallucinations, tremors, and hyperreflexia. Despite negative alcohol and drug tests, milk thistle toxicity was suspected. Supportive measures and lorazepam led to complete symptom resolution [19].

Similarly, a 32-year-old man with ulcerative colitis (UC) developed dyspnea, leading to a diagnosis of idiopathic pulmonary arterial hypertension (IPAH). Despite beraprost therapy, his condition worsened until it was discovered he had been taking Qing-Dai for UC. Upon discontinuation of Qing-Dai and continuation of beraprost, his PAH improved [20].

A review of 133 clinical case reports of interaction reported that St. John's wort was implicated in 37 cases, making it the most common herb involved in interactions, while warfarin was the most frequently implicated drug, with 34 cases of interaction with various herbs [21].

Chiropractic care

Chiropractic care, focusing on spinal manipulation and manual therapy, is commonly sought for musculoskeletal conditions, particularly low back pain and clinical evidence supports the effectiveness of chiropractic adjustments in reducing pain and improving function for certain conditions [22]. One unique case report documented the management of a 59-year-old Chinese male taxi driver who presented with progressive lower back pain and walking difficulty for two months, attributed to lumbar disc herniation causing S1 radiculopathy. Despite a Parkinson's disease (PD) diagnosis 18 months prior and an initial levodopa response, he experienced worsening motor symptoms and pain. Orthopedic assessment revealed cervical and lumbar spondylosis with disc prolapses, exacerbating his symptoms. Traditional treatments failed, leading to chiropractic intervention, including spinal manipulation and thermal ultrasound therapy. Within 11 weeks, he showed significant improvement, with pain resolution, improved postural stability, and gait performance, highlighting the potential benefit of chiropractic care in managing PD-related musculoskeletal symptoms and enhancing overall well-being [23]. In another case, a 30-year-old Asian male diagnosed with ankylosing spondylitis at age 12, presenting with severe pain and limited mobility due to fusion of sacroiliac and facet joints despite medical intervention. He showed improvement after 12 weeks of chiropractic manipulative therapy. Treatment involved grade five manipulation of the thoracic spine and grade three mobilization of the lumbar and cervical spine, alongside physical therapy and stretches. Despite the advanced stage of ankylosing spondylitis, the patient reported some pain relief and increased spinal flexibility, highlighting the potential efficacy of chiropractic interventions in managing symptoms of this condition, as shown in Figure 3 [24].

In one particular case report, eight patients referred by an orthopedic surgeon for chiropractic treatment following lumbar spine total disc replacement were assessed in a prospective case series. These patients, experiencing persistent post-surgical low back pain (LBP) or pelvic pain, received eight to ten chiropractic treatments focusing on lumbar spine side posture manipulations. Outcome measures included benign, self-limiting, and serious adverse events after spinal manipulative therapy, as well as assessments of disability, pain intensity, and fear avoidance beliefs. Despite experiencing short-term increases in pain and stiffness during treatment, no major or irreversible

complications were observed, indicating that chiropractic interventions may be beneficial for managing persistent post-surgical LBP in patients with lumbar disc replacements [25].

However, several case reports have noted significant setbacks occasioned by the lack of a multidisciplinary approach in chiropractic practice. One particular report documented the case of a 58-year-old man with myelofibrosis (MF) who experienced intractable bone pain despite prior treatments, including splenectomy and targeted therapy with ruxolitinib.

Despite resistance to medical, analgesic, and physical therapies, significant pain relief was achieved shortly after initiating chiropractic treatment. However, the patient's condition continued to deteriorate, leading to his death from septic complications. While chiropractic treatment provided relief from bone pain in this case, it did not alter the overall disease course or prevent eventual complications [26]. A review of published cases has also reported that many chiropractic-related deaths have occurred after the procedures, arguing that the risks associated with chiropractic care far outweigh its benefits [27].

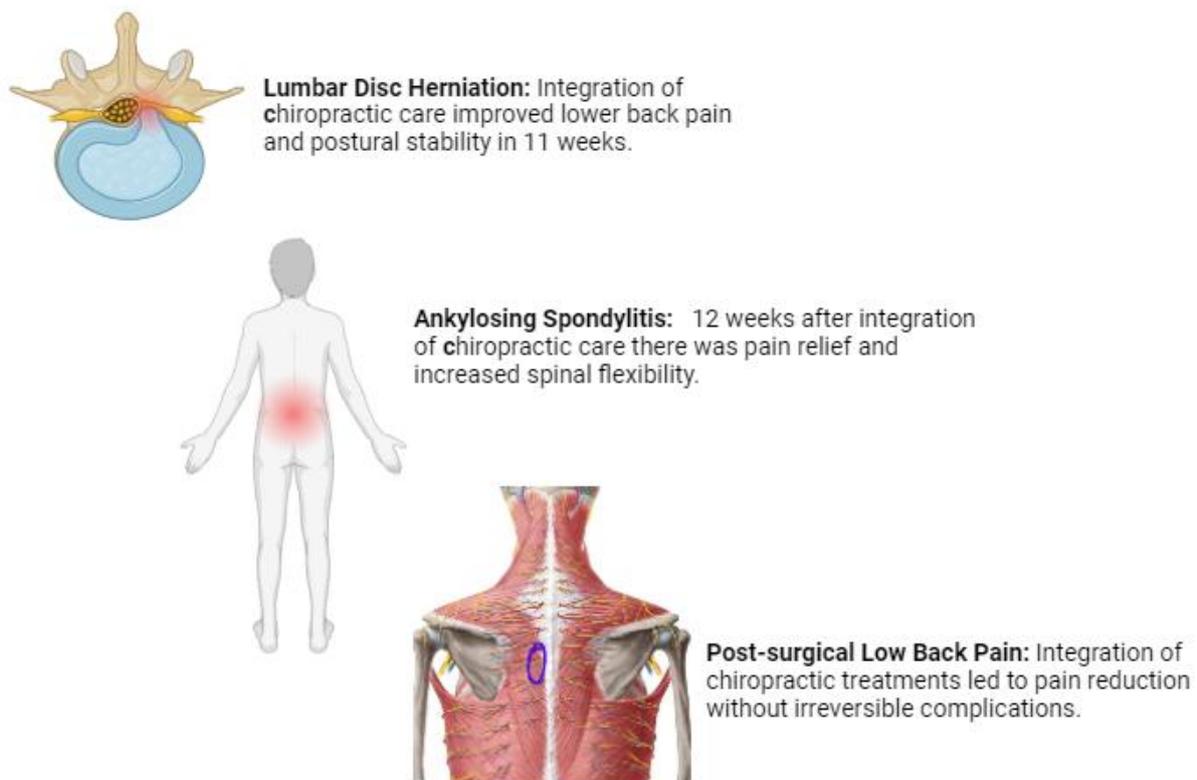


Figure 3 Illustrates how chiropractic care has been incorporated into various mainstream healthcare practices, showing specific cases and their outcomes.

Mind-body practices

Mind-body practices encompass a broad spectrum of techniques, including meditation, yoga, tai chi, and biofeedback, which integrate mental, emotional, and physical elements to promote health and well-being. These practices have gained recognition for their potential benefits in stress reduction, anxiety management, and chronic disease management [28].

Mind-body medicine is growing in popularity, especially among cancer patients. A case report documents two cases. The first case involved a 47-year-old woman with invasive ductal carcinoma and ductal carcinoma in situ of the left breast, who experienced significant anxiety, depression, fatigue, dyspnea, and diarrhea post-mastectomy and chemotherapy. Participating in a day care program, she learned

relaxation techniques like meditation and self-administered naturopathic treatments, leading to the resolution of anxiety and depression and improvement in physical symptoms. Three months post-program, she continued practicing these techniques, but anxiety resurfaced with suspected cancer recurrence, which subsided after a reconstructive surgery, leaving her nearly anxiety-free. The second case was a 40-year-old woman with a history of malignant melanoma and recurrent excisions of suspicious nevi, who faced psychological distress and chronic pain. Mindfulness training, yoga, and lifestyle changes during a program helped improve her role functioning, decrease insomnia and anxiety, and alleviate back pain. Three months post-program, she sustained these improvements, maintaining her yoga and mindfulness practices, while

also embracing lifestyle modifications for overall well-being [29].

Another case report that documented the integration of CAM in mainstream healthcare involved a 14-year-old with chronic migraines, transient ischemic events, and anxiety, who was referred to a Pediatric Medical Yoga Clinic from Pediatric Neurology. Family history included an aortic aneurysm, brain tumor, and migraines. She experienced anxiety, panic attacks, and anger, impacting her daily life. Medical yoga therapy was prescribed, comprising postures, deep breathing, mindfulness exercises, dietary changes, and supplements. After eight weeks, the patient showed improved anxiety and migraine control. At sixteen weeks, she continued to improve with reduced anxiety and minimal migraine occurrences. Medical yoga therapy enhanced the patient's coping skills and resilience, offering a holistic approach to managing her conditions alongside conventional treatments [30].

Similarly, a clinical case documented a 55-year-old COVID-19-positive patient with multiple comorbidities, including diabetes, hypertension, hypothyroidism, and chronic kidney disease, who was successfully treated using an integrative therapy plan combining Yoga, Ayurveda, and Modern Western Medicine (MWM). After starting the integrative therapy, the patient experienced rapid improvement in symptoms within two days, with complete relief within nine days. In addition, blood sugar levels, previously uncontrolled with MWM, significantly improved within five days and returned to normal within 12 days, showing promise as a scalable treatment option for COVID-19 patients with comorbidities [31].

However, a study reviewing case reports found that adverse events from yoga affected the musculoskeletal system in 35.5% of cases, the nervous system in 18.4%, and the eyes in 11.8%. About 19.7% of cases fully recovered, 11.3% partially recovered, 1.3% had no recovery, and 1.3% resulted in death [32].

Growing Use Of Complementary and Alternative Medicine (CAM) in Mainstream Healthcare



Figure 4 The expanding use of CAM in mainstream healthcare

Limitations

This study has several limitations that should be considered. While it provides qualitative insights into the integration of CAM into mainstream healthcare, it does not include quantitative data or statistical analysis to support the efficacy claims of the discussed CAM practices. Furthermore, the reliance on published case reports may introduce some degree of publication bias, as studies with positive outcomes are often more readily

available, potentially leading to an incomplete picture of CAM's effectiveness. Therefore, the conclusions drawn should be viewed with a degree of caution, as the current literature may not fully capture the effectiveness and safety of CAM interventions.

Further research need

Due to the growing popularity and adoption of CAM, as shown in Figure 4, as well as the reported adverse events associated with its use, there is an urgent

need to investigate the safety, efficacy, and optimal delivery methods of CAM therapies through rigorous clinical trials and observational studies. Understanding the underlying mechanisms of CAM modalities can inform treatment optimization and personalized medicine approaches.

Large-scale epidemiological studies are essential for assessing safety profiles, identifying adverse events, and mitigating risks associated with CAM use. Research should also focus on integrating CAM with conventional medicine, developing evidence-based guidelines, and promoting patient-centered care. In addition, investigating patient preferences, outcomes, and experiences with CAM can inform shared decision-making and improve care delivery. Education and training programs for healthcare professionals on CAM integration need evaluation to ensure competency and safety. Economic evaluations and policy research are crucial for assessing cost-effectiveness, addressing regulatory issues, and ensuring equitable access to CAM therapies. Multidisciplinary research efforts are essential for advancing the evidence base and promoting the integration of CAM.

Conclusion

The integration of Complementary CAM into mainstream healthcare represents a significant shift towards patient-centered care and holistic treatment approaches. Through the analysis of case reports, this study has provided insights into the efficacy, challenges, and opportunities associated with CAM integration. CAM modalities, including acupuncture, herbal medicine, chiropractic care, and mind-body practices, have demonstrated efficacy in managing various health conditions, often complementing conventional treatments. However, challenges such as adverse events, lack of multidisciplinary approaches, and disparities in access to CAM services highlight the need for ongoing research, education, and collaboration among healthcare stakeholders.

Moving forward, it is essential to prioritize evidence-based practice guidelines, promote interdisciplinary communication, and address regulatory and reimbursement barriers to ensure safe and ethical CAM integration. By embracing patient-centered care principles and fostering dialogue between conventional and CAM practitioners, healthcare systems can enhance treatment options, empower patients, and improve overall health outcomes.

Declaration of competing interest

All authors declare that they have no competing interests.

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This study received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Ethical statement

Not applicable. All data in our study came from publicly available data, and our study did not recruit human subjects.

Data availability

All data in our current study came from public databases, and all results were presented in this article.

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